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SOVIET UNION
EKO: ECONOMICS & ORGANIZATION OF
INDUSTRIAL PRODUCTION

No 4, April 87

[Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA published in Novosibirsk.]

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LENIN'S MANAGEMENT PRACTICES RECALLED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 3-17

[Article by Ye. I. Komarov, docent, Moscow Institute of Management S. Ordzhonikidze: "The Point Is To Get the Job Done!"; passages in all capital letters published in italic in the original]

[Text] "Comrades, let us remember Lenin more frequently"--these words uttered at the 27th CPSU Congress contain an appeal for further study of Lenin's theoretical and practical legacy and its creative application under modern conditions. One of the most important functions of the manager is to make and implement management decisions. To make the correct decision promptly is the first aspect of the matter; to be able to implement it is the second. The unity of these two aspects is one of the manifestations of efficiency. As was noted in the resolution of the 27th Party Congress, "in order to accelerate our progress it is especially necessary to have efficiency, which is still lacking in many workers who are inclined to replace business with talking shop and making groundless assurances and promises." Because of his profession the manager must be able to get the job done without substituting a "gross output" of decisions and paper results. "We have too many idle conversations of all kinds," emphasized V. I. Lenin, "the time has now come to change over to practical work.... We must get the job done!" (Footnote 1)

Headed by the SNK [Council of People's Commissars and the STO] Council of Labor and Defense

When it first begin its activities the Sovnarkom resolved problems of socialist construction while performing legislative and executive-management functions. The decisions of the SNK, which were of great sociopolitical significance, were considered and approved by the VTsIK [All-Russian Central Executive Committee].

The Council for Worker and Peasant Defense (the STO) was created on the basis of this in April 1920 (resolved problems of strengthening the fighting efficiency of the Red Army and combining the efforts of the front and rear in the struggle against interventionists and internal counterrevolution. The STO published decrees, orders and instructions that were mandatory for all central and local management agencies.

For the consideration of minor issues (V. I. Lenin called them "Vermicelli") in 1917 a special commission was created which in the minutes was called the "Vermicelli Commission." Subsequently it was transformed into the small sovnrakom. After the approval of issues by V. I. Lenin as the chairman of the SNK and STO, the decisions of the Small Sovnrakom were formulated as decrees of the SNK. Lenin called the Small Sovnrakom his first assistant. Sometimes he would ironically add: "This is my correction of the 'management' of affairs by the Sovnrakom." (Footnote 2)

During the first months of Soviet power V. I. Lenin proposed a system of preparation and coordination of drafts of decisions regarding issues brought up for consideration of the SNK. This system reflects V. I. Lenin's desire "to place random elements in an organizational channel." Vladimir Ilich fought against attempts on the part of certain managers to "drag" minor business into SNK meetings. He removed questions regarding things like this from the agenda of the meetings and returned them to be resolved directly in the departments themselves.

V. I. Lenin further suggested this policy: in order to discuss an issue it was necessary to submit a brief explanatory note (no more than two to three pages), a draft of the SNK resolutions, responses to the draft from all interested departments, and an alternate draft in the event that some department did not agree to it. The secretariat was to send materials to all members of the Sovnrakom ahead of time. In December 1917 V. I. Lenin wrote a draft of a decree, as it would now be called, on "systematic preparation of an issue" which include the requirement that each people's commissar who raised an issue for the consideration of the Sovnrakom would submit a "PRELIMINARY WRITTEN declaration with an indication:

"a) What the issue consists of (briefly) [this information could not be limited simply to the reference ('about such and such') but must consist of THE PRESENTATION OF THE CONTENT of the issue]:

"b) What precisely was being proposed to the Council of People's Commissars? (to given money; to adopt A CERTAIN RESOLUTION AND SO FORTH, and precise instructions about WHAT the person introducing the issue wanted);

"c) Whether or not this issue of the department involves other commissars? Which ones precisely? Whether or not they have written conclusions?" (Footnote 3)

This draft was approved by the Sovnrakom. V. I. Lenin inevitably adhered to it, overcoming the lack of desire of certain managers to adhere to the established policy.

Lenin's approach to establishing the policy for preparing and adopting decisions is important for the present day as well. Today there are frequent cases in which decisions made as a result of coordinations in various management agencies are drawn out over a long period of time because of the fact that there is no efficient system that establishes the sequence of

preparation, consideration and adoption of decisions and also determines the personal responsibility for a tardy or a bad decision.

At meetings of the SNK and STO V. I. Lenin quickly grasped the "heart of the issue" and formulated a decision. But this did not mean that a decision on the floor that was suggested by another manager was rejected or ignored. Vladimir Ilich in this case rapidly grasped its expediency and asked "to dictate."

It sometimes happened that the majority of members of the SNK adopted a decision with which Lenin did not agree. V. I. Lenin either "submitted to the majority without reservation" or, if the issue was of principal significance, continued to defend his opinion, suggesting that the issue be discussed in the VTsIK, the Politburo, the Plenum of the Central Committee or at the party congress.

When solving state problems, as V. V. Vorovskiy noted, V. I. Lenin did not take a step until he was convinced that the opinion was not only his own, but also the same as that of many of his advisers. V. I. Lenin expressed this approach in the following words: "I personally cannot decide for the party or on its behalf." (Footnote 4)

L. A. Fotiyeva noted that Lenin resolved many issues through coordination with interested departments on the telephone, but at the same time he was attentive to objections to the solutions he proposed and, if there were a disagreement on the part of even one member of the SNK or STO, he turned the issue over to be resolved by the collective (the Sovnarkom, the STO, the Politburo and so forth). Even such an issue as the postponement of a meeting from an appointed day to another day or hour was not something V. I. Lenin would decide on unilaterally. He instructed the secretary to ask all members of the Sovnarkom and to record the answers. (Footnote 5)

An important rule of Lenin's was to relieve the central agencies from having to consider minor issues while at the same time increasing the independence and responsibility of the people's commissariats. "The small SNK, the STO and the SNK," wrote V. I. Lenin, "must do everything they can to relieve themselves of Vermicelli, instructing the people's commissariats to resolve trivial matters for themselves and to be more strictly responsible for them.... To reduce the number of cases in the small SNK, STO and SNK, and reach a point where the people's commissariats (separately and jointly) resolve more issues for themselves and be responsible for this." (Footnote 6)

Taking Real Life Into Account

V. I. Lenin's contemporaries noted a number of characteristic features of his style from the standpoint of preparation, adoption and implementation of decisions.

In G. M. Krzhizhanovskiy's words, Lenin was an incessant fighter--for goals for whose achievement many decisions were adopted and for the implementation of the decisions that were adopted. Vladimir Ilich rapidly evaluated conditions, circumstances and the situation, taking into account factors that

both contributed to and opposed the work that had been earmarked. He tried to understand the dialectic of the issue.

Did V. I. Lenin make decisions slowly or rapidly? In certain conditions and situations that required immediate measures, the decision was made without any delay. If the issue required basic research then he carefully considered it and after this a decision was made.

During the years of the civil war specialists of the old military school encountered Lenin's rate of decision making for the first time. The development and coordination of issues took place at such rates that it was difficult to find the time required for this. There are still reminiscences of extreme quickness of decision making and the no less rapid beginning of their implementation. (Footnote 7)

At the beginning of the summer in 1921 in Moscow there were several cases of cholera. The appeals of the RSFSR People's Commissar for Public Health, N. A. Semashko, to the People's Commissariat of Finances and the People's Commissariat of Food did not help to begin the fight against the advancing epidemic. Then N. A. Semashko went to Vladimir Ilich, who in one meeting of the STO quickly solved the problem: considerable amounts of finances, transportation, food, linen and supplies were allotted.

V. I. Lenin attached a great deal of significance to careful preparation of state decisions. In a letter to the small SNK of 27 August 1921 he asked them to "devote concentrated attention to the need for FOR CAUTIOUS, CAREFUL AND THOUGHT-OUT PREPARATION of the texts of decrees.

"Endless corrections are intolerable.

"My impression is also that a number of decrees of the Small Sovnarkom have been hasty recently.

"It is necessary to take the most serious measures against this disorder so as not to cause the worst protests from the population and a position of the Central Committee that is AGAINST the Small Sovnarkom." (Footnote 8)

In spite of the large load of party and state work, V. I. Lenin himself wrote, edited and corrected an immense number of documentary decisions. During the period from October 1917 through October 1918 V. I. Lenin led the development, participated in the preparation and signed more than 3,000 decrees. (Footnote 9)

When developing the new economic policy and dealing with the question of replacing the requisitioning of farm produce with a produce tax, V. I. Lenin carefully analyzed the country's economic position. He spoke at length with petition bearers, red peasants' letters, visited a number of towns and villages of Moscow province, participated in the conference of nonparty peasant delegates to the 8th Congress of Soviets that was created at his suggestion, and consulted with leading party and state figures and with local party and soviet workers. The basis of the decision to replace farm produce requisitioning with a produce tax was the realistic evaluation of the

socioeconomic situation and practical experience as well as the opinion of the masses and the leaders. In all this one could see a Leninist desire "to take into account real life, precise facts OF REALITY, and not to continue to hang on to yesterday's theories." (Footnote 10)

In October-November 1922 V. I. Lenin considered and resolved many large economic issues. The Urquhart concept; the work of the American tractor detachment to help Soviet Russia; the situation in the Donbass; the development of laws concerning land, labor and local budgets; the ship repair program; the activity of the Gidrotorf; the arrangement of the electric industry; the petroleum business in Baku; the NKPS [People's Commissariat of Railroads] estimates; the Michurin Experiment; assistance for the economic advancement of Armenia; the construction of hydroelectric stations in Georgia; and economic construction in Karelia.

As L. A. Fotiyeva noted, not a single question of great political or economic significance was resolved without the direct participation and guidance of Lenin. (Footnote 11) To those who went to V. I. Lenin for help in solving some problem or accelerating the course of some work, he immediately responded with practical actions, in deeds--with the support of people, materials and monetary funds. V. I. Lenin's word, when it was given to a person, it was backed up by his deed. The word according to Lenin is a means of practical solution or acceleration of a matter.

Speaking of the Leninist style of decision-making on the whole, K. Kh. Danishevskiy noted the following characteristics: "To be a real politician in the bolshevist sense, to cast aside one's personal attitudes, syntheses, personal desires and other subjective aspects; to solve problems on the basis of accounting for the real alignment of class forces." (Footnote 12)

Actual Execution

V. I. Lenin placed decisions that had been made on a "practical basis," that is, he demanded and achieved their actual implementation, producing the required result. Typical words of V. I. Lenin were "to do and to do": to do everything in order that the necessary decisions be made promptly and to do it in such a way that the decisions would be fulfilled. In a letter of 22 February 1922 on behalf of the people's commissar of finances, G. Ya. Sokolnikov, Vladimir Ilich insisted on "transforming our decrees from dirty paper (it was all the same, both poor and good decrees) into real practice--here is the meat of the matter." (Footnote 13)

A decision can be made rapidly or after basic development of the issue, unilaterally or collegially, but in any case it must be efficiently carried out. One does not need "decorative decisions," that are made only in order to create the appearance of "movement of the issue" in order to conceal "active inactivity." V. I. Lenin inherently had an unwavering desire to implement the decisions that were made. He demanded and received this from other managers as well.

L. A. Fotiyeva notes in her memoirs that there were cases when at meetings of the SNK or STO Lenin, having discovered a failure to fulfill a government

decree, issued an order for the guilty party to be arrested for 2-3 days. Then he would add: "Arrest them on holidays and release them on work days so that our work will not suffer." (Footnote 14) For failure to carry out a decree of the STO of the Petrograd consumer commune, whose chairman was A. Ye. Badeyev, a senior party member, V. I. Lenin on 23 July 1921 submitted a proposal to the Politburo: "To carry out through the POLITBURO and through the STO: 1) to punish BADEYEV and his two closest associates by arresting them for one Sunday for failure to fulfill an STO order; 2) to warn them: the next time we will put them away for a MONTH." (Footnote 15)

When implementing decisions V. I. Lenin used two levers "to full capacity"--personal responsibility and verification of execution. In a letter to N. A. Semashko regarding the fulfillment of a decision of the STO for preventing the cholera epidemic, V. I. Lenin asked:

"What is being done (and what has been done?) in Moscow? Who is responsible for the work? Is it only 'bureaucrats' with a magnificent title who does not understand or know a single thing, who only signs little papers? Or are there BUSINESSLIKE leaders? Who specifically?

"To achieve personal responsibility--this is the main thing.

"What has been done in order to achieve personal responsibility?

"Verification through whom?

"Through inspectors? How many of them?" Who are they?

"Through youth detachments (KSM)? Are there such things? How many? Where and how have they proved themselves?

"What other means of REAL verification are there?

"Are they wasting money to buy expensive things? Carbolic acid? Cleaning implements? How many have been purchased?) or on keeping new 'bureaucratic' do-nothings?" (Footnote 16)

When evaluating various departures from personal responsibility, incorrect understanding and abuse of collegiality, V. I. Lenin formulated the basic provisions whose observance comprise a most important condition for the organization of the process of preparation, adoption and implementation of management decisions.

V. I. Lenin demanded the establishment of the strictest responsibility for executive functions. He himself strictly adhered to the principle: "Discussion is for everyone, but responsibility is unilateral. We suffer from our inability to achieve this at every step." (Footnote 17) "It is necessary," he wrote, "to wage a merciless battle against the prevailing dispersion and lack of clarity in the question of what each person is individually instructed to do and against the complete irresponsibility that ensues from this." (Footnote 18)

Lenin's understanding of the principle of personal responsibility and collegiality was and still is the basis for the process of preparation and adoption of management decisions, verification of their implementation and the achievement of the necessary practical results. Practice has confirmed that any deviations from this principle lead, in the final analysis, to a situation where "the whole business of management becomes imaginary and illusory in nature." (Footnote 19)

The typical devices for evading personal responsibility are developing unlimited collegiality; hiding behind commission, staff, and councils; finding "objective causes"; shifting responsibility to others; and creating a circulation of papers, signatures and stamps. These devices are nothing other than a lack of desire on the part of one manager or another to take personal responsibility for making necessary and prompt decisions, poor-quality work, or the inability to implement decisions. Certain managers create only the appearance of making the necessary decisions: it seems that decisions are made and a good number of them, but the problem remains the same as it was. In justifying themselves such managers put forth paper measures: we tried to resolve it, we reacted, we discussed, and so forth.

In his day V. I. Lenin discussed the fact that it might be necessary to have an extraordinary commission for eliminating certain bad drafts (Footnote 20), and he suggested awarding a bonus for the best draft of a decree if it is successful for a year: 100 percent success--100 percent bonus, 1 percent success--1 percent bonus. (Footnote 21) In essence Lenin's advice contains the idea of evaluating management decisions from the standpoint of their practical significance. A large number of decisions was juxtaposed to an effective solution to existing problems, a flow of instruction papers--to actual results.

The force of decisions--how concrete, practical and calculated they are. Having become familiar with the points of a report at the 8th All-Russian Congress of Soviets concerning improvement of the activity of Soviet agencies, and the fight against bureaucratism, V. I. Lenin demanded "reworking the points fairly radically, in all the points, in the direction of a very great reduction of promises that are extremely indefinite, diffuse and excessive, and shifting the center of gravity to concrete and practical proposals that are precisely calculated for implementation in a short period of time." (Footnote 22)

Organization of Control

V. I. Lenin never made on-the-spot decisions "in general." His decisions were concrete and they had a precise address (to whom and what to do) and the necessary deadline for implementation. Vladimir Ilich usually designated the "calendar" time for implementation of decisions, assignments and instructions, which, as a rule, was not very long. In minutes of meetings of the SNK they also pointed out the time periods for the implementation of measures. Sometimes STO meetings began with a verification of the implementation of decisions that had been made previously. "It became uncomfortably hot" for those managers who had not implemented the decisions. He immediately blew up at this worker and demanded the most severe punitive measures. (Footnote 23)

V. I. Lenin considered well-arranged "office" work to be a mandatory condition for monitoring the implementation of decisions. For systematic verification of the implementation of decisions the SNK and STO used the journal (in the form of an office book) and card system. V. I. Lenin devoted the proper amount of attention to this area of work, revealing and eliminating cases of inaccuracy and ambiguity. Once V. I. Lenin checked the condition of work for monitoring the implementation of decisions by the SNK and STO. The control cards, as it turned out, were being kept inaccurately and the established form for filling them out was not being observed. In a note to the STO business manager V. A. Smolyaninov of 15 May 1922 Vladimir Ilich demanded that he straighten out the verification of implementation and the filling out of the cards.

V. I. Lenin considered monitoring of implication and verification of what is going on to be one of the most important tools in the work of the manager. In the "decree concerning work of deputies (deputy chairmen of the SNK and STO)," in the first point V. I. Lenin writes: "The basic works of the deputies for which they are especially responsible and to which they should subordinate everything else is the verification of the actual implementation of decrees, laws and resolutions." (Footnote 24)

Another very important thing for implementing decisions is personal control on the part of the manager which combines systematic work, unexpected events, and even random events. The Manilov habit of painting a pretty picture for managers concerning the state of affairs and the course of their work is still in evidence among certain workers. Therefore the rule of having unexpected inspections presupposes personal inspection even of sections that are operating well.

In January 1922 V. I. Lenin happened to learn about the condition of motor trolleys of the VChK [All-Russian Extraordinary Commission for Fighting Against Counterrevolution and Sabotage] at the Moscow Railroad Center. The condition in which V. I. Lenin found the motor trolleys and the organization of their movement was "worse than bad": complete disorder, frequent stops along the way, idle time in the stations, chaos, sloppiness. "This was the first time," wrote V. I. Lenin to the VChK and NKPS, "I traveled on the railroad not as a 'dignitary' who keeps everyone and everything on their toes with dozens of special telegrams, but as an unknown traveler of the VChK, and my impression was hopelessly depressing." And he goes on to draw the conclusion: "If these things happen with an especially small cog in the mechanism which is under the special supervision of the VChK ITSELF, I can imagine what is being done in the NKPS altogether! The disorganization there must be incredible." (Footnote 25) This evaluation of Lenin's corresponded to the condition of railroad transportation at that time.

V. I. Lenin was impatient and sharp when it came to violations of deadlines for submitting materials and documents that served as a basis for making the corresponding decisions. Once A. I. Rykov, deputy chairman of the STO, delayed the preparation of a draft of points concerning the basic principles for concession agreements and submitted unsatisfactory materials. After V. I. Lenin looked them over, he wrote: "I looked over your materials concerning

the concession agreement and was deeply disturbed.... The significant material was flooded with bureaucratic garbage.... You violated the decision of the SNK (2 February 1921) that requires within THREE WEEKS the development of the MAIN PRINCIPLES!!...put a stop to this sabotage and make some progress AS YOU ARE SUPPOSED TO or else I will take this to the Central Committee." (Footnote 26)

V. I. Lenin lost control when he saw the inattentiveness, forgetfulness and negligent behavior of managers, their disorderliness in implementing decisions. In a note to N. P. Gorbunov of 10 February 1922 he pointed out, in particular: "After all there are a NUMBER of decrees of the STO concerning the urgency of the Gidrotorf and so forth and so on. Clearly they have been 'forgotten.' This is an outrage! We must FIND the parties guilty of 'forgetfulness' and TURN THEM OVER to the court. Immediately! (Let me know the result: What you have DONE)." (Footnote 27) The guilty parties were found. V. I. Lenin reprimanded them for failure to perform their job duty and for bureaucratism in the matter of Gidrotorf--in a letter of 27 February 1922.

V. I. Lenin attached special significance to developing executive discipline. "The task," he emphasized, "is to teach the people's commissariats to be punctilious, putting executives who are not punctilious in jail or driving them out." (Footnote 28) The necessary decisions lose all of their positive aspects without executive discipline and are transformed into ordinary paper. An interesting detail: if V. I. Lenin discovered that some decision was not carried out, he considered the guilty parties to be not only the manager who did not carry out the decision, but also the manager who suffered from this. Why did he not sound the alarm, why did he not nag, wake people up or complain? This statement reflects Lenin's lack of acceptance not only of undisciplined behavior, but also the lack of participation of the manager who has not achieved fulfillment of the decisions that have been made.

Efficiency as Opposed to Bureaucratism

V. I. Lenin thought that the manager, within the limits of his rights, must first test a variety of means, forms, methods and devices for solving problems. If this has not produced a result he must turn to the higher authorities. Managers who are not independent and who are afraid of responsibility act in a different way: the matter is sent "upstairs," without any action beforehand.

To make decisions does not mean to take responsibility for all management. There are managers who create a system of "the only boss": any issue, even the smallest one, must be coordinated with the "chief." Nobody decides anything without him. This system creates excessive centralization in decision making, which significantly reduces the possibility of on-the-spot activity and impedes the development of independence and responsibility of each manager for the area of work entrusted to him.

V. I. Lenin thought that each manager should solve problems in keeping with his rank and his rights. Therefore he valued business people, that is, those who are able to get things done, who take businesslike initiative, make businesslike suggestions and are capable of giving businesslike reports.

Therefore each new worker who spoke at a meeting of the Sovnarkom with businesslike proposals attracted the attention of Vladimir Ilich. For a manager can be evaluated not only in terms of what and how he decides, but also what and how he suggests doing this in practice.

V. I. Lenin clearly characterized one of the widespread "management disease": "WE ARE BEING DRAGGED DOWN by the filthy bureaucratic bog in writing papers, speaking about decrees, writing decrees, and our real work is being drowned out in this sea of paper."

If authorizations are issued every time whether there is good reason or not, no time is left for the real work with people or for verifying the implementation of decisions. As a result, one ends up not with real work, but with paperwork. In the political report of the Central Committee of the RKP(b) to the 11th Party Congress, V. I. Lenin noted: "People are waving orders and decrees all around us to our right and left, but they end up with something entirely different from what they want." (Footnote 30)

Lenin defined and utilized in practice such effective means of fighting against the sea of paper as the substantiation of decisions; improvement of the style and methods of work; selection and placement of personnel; and monitoring and verification of execution.

V. I. Lenin thought that in order to substantiate decisions it was not necessary to get caught up in giving orders or to flaunt one's rights. "If a communist is an administrator," he wrote, "his first duty is to guard against giving too many orders and to be able first to take into account that which science has already developed, first to ask whether the facts have been verified, first to study the matter (in reports, in the press, at meetings and so forth)--to study the precise place where we have made a mistake, and only on the basis of this should he correct what has been done. We should have fewer devices like those of Titych ("I can assert, I cannot assert") and more study of our practical mistakes." (Footnote 31)

Decisions should be based on facts, data, an analysis of these, a study of experience and mistakes, and the achievements of one science or another. A manager of the corresponding rank has the right to "assert" and "not assert." But the entire issue consists in how this right is utilized: in a businesslike or in a bureaucratic way. In a businesslike way this means to decide and to act concretely, specifically, without "general" instructions. In a bureaucratic way--at this time the red tape begins, the game of verification commissions, or purely bureaucratic murder of a living thing.

In his famous letters to his Deputy A. D. Tsyurup, "On Restructuring the Work of the SNK and STO and the Small SNK," V. I. Lenin noted the need to shift the center of gravity from writing decrees and orders to the selection of personnel and the verification of execution. Herein lie the main directions of the work for the successful implementation of decisions and the achievement of significant practical results.

The observance of Lenin's requirements and the mastery of the features of Lenin's style of adopting and implementing management decisions are of great

significance for modern practice and improvement of the activity of the administrative staff and managers. Therefore, as is noted in the CPSU program, it is necessary in the future to continue to establish a Leninist style in party work and in all spheres of state and economic management.

FOOTNOTES

1. Lenin, V. I., "Poln. Sobr. Soch." [Complete Collected Works], Vol 37, p 400.
2. "Vostominaniya o vladimire y iliche lenine" [Reminiscences of Vladimir Ilich Lenin," in five volumes, third edition, Moscow, Politizdat, 1984, Vol. 4, p. 1983.
3. Lenin, V. I., "Poln. Sobr. Soch." [Vol 54, p 384.]
4. Ibid., Vol 47, p 47.
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19. Ibid., Vol 54, p 101.
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25. Ibid., Vol 54, p 115.
26. Ibid., Vol 52, pp 114-115.
27. Ibid., Vol 54, p 159.
28. Ibid., p 259.
29. Ibid., Vol 44, p 364.
30. Ibid., Vol 54, p 96.
31. Ibid., Vol 42, p 347.

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ECONOMIC RESTRUCTURING PROCESS EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 18-38

[Article by N. Ya. Petrakov, corresponding member of the USSR Academy of Sciences, and Ye. G. Yasin, doctor of economic sciences, Central Economics-Mathematics Institute of the USSR Academy of Sciences (Moscow): "First the Experiment and Then Radical Restructuring: Opinions, Facts and Commentary"]

[Text] This article is based on data from a questionnaire of managers of associations and enterprises of the electrical equipment industry concerning the results of the large-scale economic experiment. The initiator of the questionnaire was Dr of Economic Sciences Vladimir Yegorovich Astafyev, who for many years was in charge of the Planning and Economics Administration of the ministry with which our institute has been cooperating for these 3 years in analyzing problems of improvement of the management mechanism.

Is it worthwhile, however, to return to the experiment, not to mention opinions about it? After all, the methods of management that have been verified since the beginning of 1987 have been extended to all branches of industry. And the main thing is that the 27th CPSU Congress took place, at which it was clearly stated: "It is important to solve new problems in economics without a deep restructuring of the economic mechanism." Its basic directions have been earmarked, taking into account the experience in conducting the experiment as well.

Nonetheless, a serious study of the lessons of the experiment, in our opinion, is not simply useful; it is more necessary than ever before. For, as was stated at the congress, we are only at the beginning of the path to an integrated and effective system of management. Precisely what should be done in the future and how--various ideas are being expressed regarding these questions. The words "radical restructuring" include a variety of meanings. Even for this reason the opinions of managers who have been working under the new conditions for more than 2 years deserve attention.

The questionnaire was conducted in two rounds--in October 1984, that is, at the end of the first year of the experiment, and it included participants in the Conference of Managers of Economic Services of the Branch for Discussing the Course of the Experiment (about 180 questionnaires were received), and in

August 1985, when it had already been determined how justified the expectations were--the questionnaires were sent to all directors of associations (enterprises) and also managers of economic services, and about 500 questionnaires were returned.

The Overall Evaluation

In the first round 92 percent of those questioned gave a positive evaluation to the influence of the experiment, including 60 percent who were confident about this. In the second round the number of positive evaluations was 90 percent, including 55 percent who were confident of their answers. The approval can be considered unanimous. The changes were not significant. In order to understand whether they were random or not it is necessary to take into account the fact that the pioneers of the experiment, including enterprises of the Ministry of the Electrical Equipment Industry, during the first year of the experiment had certain advantages with respect to supplies and the provision of transportation, and the intention of party and planning-economic agencies was focused on them. And this could not but influence the results as much as the methods that were being verified did. In 1985 the number of participants increased to such an extent that it was impossible to give preference to all of them.

Here is how this was reflected in the evaluation. In the first round 32 percent of those questioned definitely linked the positive results of their work to the conditions of the experiment and in the second round this proportion dropped to 26 percent. And the proportion of those who thought the improvement of their work was brought about by the changes in supply and other external factors increased from 30 to 40 percent. In 1985 only 14 percent of those questioned found the supply to be better than in the first year; 33 percent indicated that it had not changed; and 46 percent thought that it had deteriorated to one degree or another. This is an important aspect: for the experiment did not affect the organization of supply or the overall policy for distributing resources. It was to have answered the question of whether or not it was possible to achieve the required changes in the rates, quality and effectiveness of production without fundamentally changing anything else in this sphere. Evaluations that were given, particularly when taken in conjunction with the objective indicators of their work, show that it is impossible. Let us recall that the filling of orders throughout the branch in 1985 deteriorated as compared to the first year of the experiment, clearly not without the influence of the frequent interruptions in supply of metal, energy and chemical materials.

The Effect of Normative Methods

But let us leave to the side for the time being those eternal debates about supply; obviously, in any case not all achievements of the experiment are explained by these special conditions. What are the causes of the positive results? In our opinion, the main factor is economic normatives.

As we know, the replacement of the number of directive indicators with economic normatives and the expansion of the independence of enterprises on this basis comprise one of the most important elements of the new methods of

management. The experiment has confirmed this. There is an especially great effect from normative planning of the wage fund and changing over from the directive indicator of its volume to the increased normative. It is as though the normative says: If you want to earn more, increase your production and produce products with fewer personnel. The report data show: the expectations were confirmed. The increase in commercial output remained at a level of 4.5-5 percent during both years while the number of personnel stabilized. If only it were that way everywhere! Let us note that the commodity output was not planned directly.

Of course the skeptic has the right to say: Again you are judging according to value indicators, and they can be increased in various ways. But how sure can you be that it was the normative formation of the wage fund that played the significant role in this? Legitimate questions! But here is what some managers of enterprises think about this. To the question, "Does the normative method of financing the wage fund and the utilization of savings from it influence the growth of labor productivity and the release of labor force?" 89 percent answered in the affirmative in the first round (including 53 percent who were certain) and 82 percent in the second round (including 45 percent who were certain).

Again there was practically complete unanimity. But there was also a certain deterioration of the ratings in 1985. The control question: "Do you consider it expedient to return the wage fund to individual planning?" The overwhelming majority were against this: in the first round, 85 percent, including 57 percent who answered resolutely; in the second--76 percent, including 48 percent who answered resolutely. Again, a reduction. The main reason for the appearance of this tendency, in our opinion, is that there was less confidence in the stability of the policy that had been adopted. Only 13 percent of those questioned on the second round were convinced that this policy will remain during the 12th Five-Year Plan; in the first round, 20 percent were. The number of those who were fluctuating increased.

The course of events showed that there was justification for the fears. The policy remained, but the normative was reduced by a factor of 1.8. One more explanation: for certain people the previous policy was more convenient: there was less independence but there was also less responsibility. It is possible to get out of the additional fund, but not the normative.

Incidentally, the current policy is two-sided. The old method is used to determine the wage fund for industrial personnel and workers at newly introduced facilities. Reproaches are expressed against the increased normative and it is proved that the level normative (in percentages of the fund-forming indicator) is preferable: the incentive qualities are stronger and the increase in earnings does not depend on the level achieved or concealed reserves. An analysis, however, shows that this is not all so simple. In the first place, the level normative is a particular case of the increased normative. The entire question has to do with the amount of the normative: if it is equal to 1 (the percentage of increase in the wage fund to the percentage of increase in volume), the increased normative becomes the level normative, and the force of the incentive, naturally, is greater than with 0.25. In the second place, our hypothesis that the backward businesses

have greater reserves and can catch up with the leading ones in terms of their levels of earnings is not confirmed; an analysis shows that even at the beginning the earnings for the former were frequently higher than for the latter. During the course of the experiment the restoration of fair conditions proceeded more rapidly. In the third place, and this is the main thing, the level normative, as the experience of the Ministry of Heavy Machine Building showed in 1984, under modern conditions cannot be made single and stable. But the increased normative can be, and it already is. And this is extremely important: it is necessary to accustom everyone to the inflexibility of the normative and the impossibility of bargaining with its amount for one plant or another.

There is no doubt that the normative policy for forming the wage fund should be further improved. We assume that the first thing to do would be to eliminate the normative net output and establish a normative to the actual net or final (conventional net) output taking into account increments and rebates to prices and also subtracting the initial payment. This alone would link the payment not only to the increase in physical volumes but also to the improvement of product quality and the increase in effectiveness. The contribution of economic normatives to the acceleration achieved in the experiment is unquestionable. But it could also be greater if the entire mechanism were operating like a well-arranged orchestra.

Is the Pendulum Swinging Toward the Consumer?

Another most important measure of the experiment is the changeover to evaluating the activity of enterprises in terms of the level of fulfillment of commitment for deliveries and the strengthening of incentives linked to this indicator. The goal is to provide for a changeover to the consumer, to strengthen his positions and to strengthen delivery discipline. Have we managed to achieve this? The reports show that on the whole deliveries are made promptly and completely. True, in the Ministry of the Electrical Equipment industry in 1985 they were fulfilled by 98.9 percent as compared to 99.1 percent in 1984, but in 1983 the enterprises were satisfied with 96.9 percent, and this was one of the best indicators in the industry. The effectiveness of the measures that have been taken is confirmed by the data of the questionnaire. A positive rating was given to them in the first round by 91 percent of the managers, and in the second round--87 percent. But opinions differed concerning the question of whether or not the level of fulfillment of deliveries achieved during the experiment would change if the conditions for supply and transportation did not change.

| | October <u>1984</u> | August <u>1985</u> |
|---|------------------------|-----------------------|
| Thought that the level achieved could be maintained | 52 | 37 |
| Including those who were confident of this | 29 | 12 |
| Thought that the level of deliveries would drop | 44 | 62 |
| Including those who were confident of this | 16 | 21 |

Thus in the first round the proportion of optimistic ratings decreased while the proportion of pessimistic ones increased. These results agree with the data concerning the reduction of the level of fulfillment of deliveries in the branch, especially in the first half of 1985. This can be only partially explained by the disturbance of the rhythm of operation of industry because of weather conditions. And the main cause is the system of planning and supply, which remain the same, and its inability with the current organization to maintain even the level achieved in 1984.

It is worth thinking about the indicator that is being applied for the fulfillment of deliveries: How correctly does it reflect the state of affairs? It has already been noted in the press that the enterprises can fulfill deliveries by 100 percent and receive the incentives coming to them from this but still pay fines for delivery shortages. For the accounting is done according to the dispatch and not according to the dates indicated in the contracts, but as of the end of the quarter. The result is this: in 1985 the proportions of enterprises that did not fulfill their commitments were: in October--51.2 percent, November--51.9 percent, December--40.1 percent; and the level of fulfillment of deliveries were 98.6, 98.6 and 98.9 percent, respectively. By the end of the year they made up for the arrears in the indicator, although it is actually impossible to make up for the failure to fulfill commitments on time. Here we see clear indications that the technology of achieving "good" new indicators is being mastered successfully.

Let us look a little further. It is no secret that in the agreements the time periods are rarely fixed precisely as compared to the orders on the basis of which they are concluded. This is more convenient for the producer. The dominance of the producer is reflected in this. But the indicator for making deliveries of this kind is not taking into account qualitative aspects. It is possible to achieve 100 percent and the management will be satisfied, but the consumer will be left in his previous position.

Since the beginning of the experiment there have been stronger complaints from the consumers regarding the fact that the suppliers have begun more frequently to steer away from disadvantageous orders, and mainly the ones that involve risk. One can understand this: for the percentage of underfulfillment of deliveries now "costs" the latter 18 percent of the material incentive fund! To a question regarding this the managers of enterprises performing the role of suppliers in the first round largely denied this danger and the associated threat of the reduction of the growth rates of production; only 30 percent admitted that this exists. But in the second round the proportion of those who consider this danger to be serious increased to 50 percent, and the proportion denying it decreased from 64 to 44 percent. It seems that the influence of economic normatives on the growth of production and labor productivity would be more appreciable were it not for the suppressing influence of the indicator of deliveries.

It would be wrong to remain silent about the fact that at many enterprises the experiment gave an impetus to the restructuring of intraplant planning and cost accounting with orders from consumers. And in places where this was done the latter received more respect. In general the usefulness of measures that were taken as temporary and appropriate in a certain stage is undoubted. But

here is what is typical: positive changes are observed mainly in places where people are prepared for them, where the level of organization and economic work was high previously. Some of the average enterprises made a certain amount of progress as well. But most of them are merely thinking about how to become oriented toward the consumer and whether or not it is worth taking this seriously. The indicator that is being applied for fulfillment of deliveries merely makes things look better; there has not been any real changeover to the consumer. It is no wonder that to the question of the need for further increasing the role of the consumers and strengthening delivery discipline, a positive answer was given by 67 percent of those questioned in the first round and 82 percent in the second round.

Planning and the Rights of Enterprises

What did the experiment envision in the area of planning? The elimination of directive assignments in volume value indicators. To carry out this measure would be to do away, finally, with the notorious "growth output." But, as it turned out, this is not so easy. Here is evidence.

The experiment granted the enterprises the right to independently adjust planning indicators for the commodity output and the normative net output in the event that the consumers rejected the products allotted to them. The very fact of giving them this right shows that these indicators could be easily changed. They are submitted to the enterprises, but only as calculation indicators. They are not planned directly but they are linked to the evaluation of the activity and the formation of the wage fund. They are used to measure the growth rates in the country, branch or rayon.

Have the enterprises taken advantage of this right? Only 10 percent of those questioned gave a simple yes; in 27 percent adjusted the indicator but with the agreement of the higher agencies, and 31 percent did not take advantage of their right although there was a need to. Then the ministry told the authors of the article that in practically every case these adjustments were coordinated and with a good deal of effort in the USSR Gosplan with the involvement of the Gossnab.

When after the April (1985) Plenum of the CPSU Central Committee a course was earmarked toward acceleration of socioeconomic development, many perceive this as a signal to increase the growth rates of value indicators (commodity output, sales volume), putting pressure on enterprises to this end by giving them additional assignments with respect to these indicators. And it is no wonder that in 1985, as a rule, the rates increased by the level of fulfillment of deliveries decreased. For the sake of fairness one must say that one cannot do without generalizing indicators, that is, value indicators. Appeals to replace them with a multitude of physical indicators which, people think, reflect the consumer value cannot be taken seriously. Nor does it work to reduce them to the indicator of the level of fulfillment of deliveries. Let us assume that everyone reaches 100 percent--what then? After this how does one judge the successes and single out the leaders? Those same value indicators which have been used up to this point reflect only the quantitative growth of the volumes and also of the prices. Is it necessary to accelerate these? for we are speaking primarily not about increasing effectiveness and

improving quality. For some reason for many years the proposed indicators of net or final (conventional-net) output, taking into account the increments and rebates to prices, which reflect effectiveness and quality, have never found acceptance.

Of course it is not a matter of finding the ideal value indicator. There is no such thing. Apparently it is necessary to refrain from assigning these to the enterprises even as calculation indicators. But in the evaluation of activity and the formation of economic incentive funds it is impossible to do without them. They say that their poor quality is brought about by the accepted policy of price setting. This means that it must be revised. As concerns planning in physical terms, the experiment introduced practically nothing new. An attempt was made to move up the deadlines for the development of the annual plan so that the enterprises would have more time to substantiate it, but this cannot be considered successful. There has long been a need to reject the idea of planning from above and providing funds for the entire list of products, regardless of their importance or the shortage of them. This is the opinion of enterprise managers regarding this. In the first round 53 percent of those questioned were in favor of rejecting planning from above the list of products the need for which is regularly satisfied, including 41 percent who were convinced of this. In the second round these figures increased appreciably: 68 and 49 percent, respectively. The proportion of those who think that rejection of planning the entire products list is inadmissible decreased from 21 to 14 percent.

But the question of rejecting the distribution of funds for products that are not in short supply produced a different reaction, strange as this may seem at first glance. In the first round, 48 percent of those questioned were in favor of it, including 34 percent who were moderately in favor of it; and 32 percent were against it, including 18 percent who were resolutely against it; and 19 percent did not have an opinion. In the second round the proportion of people in favor of rejecting fund forming for their products decreased to 46 percent, and those who were convinced of this--30 percent. But the proportion of opponents increased to 44 percent, that is, 12 percentage points more, mainly because of those who previously held no opinion.

The evolution of opinions concerning planning and fund forming for products that are in short supply is explained as follows. The rejection of planning the products list from above and forming the plan for the enterprises on the basis of agreements and orders increase their authority and their freedom to maneuver, but--under current conditions--this does not entail a real increase in economic responsibility. And the rejection of funding means that for products that are not in short supply, the ones whose sales involve difficulties, deprives the producers of state guarantees of sales. Having felt a certain real pressure of responsibility during the experiment, the managers thought: let us have more rights but it is better to do without increased responsibility. The position is understandable, but groundless.

In this connection we should like to note: everybody expects that things should become better and easier because of restructuring the management system. This is true in the sense that it will be necessary to take away the obstacles to normal work. But this is not at all the same thing as making

life easier for everybody in production. Many people who work today without enthusiasm, who are incapable of organizing highly effective labor and rapidly assimilating progressive technology will find things harder. And this is good. Hence it follows that one should not expect complete unanimity regarding the changes proposed by the 27th Congress.

One other explanation is linked to the fact that in the experiment there were significant differences between the plans for products lists and the orders. Only 8 percent of those questioned did not encounter this divergence. Such cases had been encountered by 31 percent, although rarely, and for 50 percent they were fairly frequent. Among the causes for the differences they name the refusal on the part of the consumers to accept the products that were ordered (40 percent), the shortage of orders (30 percent--this is why many preferred to receive fund orders, and 16 percent gave such reasons as the failure to conclude agreements and incorrect document entries; one assumes that these are the main reasons for the attempts to refrain from disadvantageous orders.

The very fact that there is a large number of cases of a lack of coordination between the plans for production and the orders shows that so far the orders of the consumers and the agreements have not yet become the basis of planning. The rights of the enterprises in this sphere have not expanded and the mechanism for their incentives and responsibility has not started to work. Here, apparently, especially large changes are needed.

New technical equipment: prices and development funds.

One must say that from the very beginning the experiment set limited goals and the verification of principally new methods of incentives for scientific and technical progress was not included among them. The decree of the CPSU Central Committee and the USSR Council of Ministers, "On Extensively Disseminating New Management Methods and Increasing Their Influence on the Acceleration of Scientific and Technical Progress" of 12 June 1985 envisions measures that are called upon to fill this gap. But it is still too early to speak about results.

These same steps that were taken in the experiment for the acceleration of scientific and technical progress are more interesting as a way of raising and discussing certain issues. Thus it is known that since 1965 the enterprises have had the right to form the production development fund (FRP) from profit and amortization. It was intended that it should be used for the needs of technical reequipment. But this measure did not produce a large effect, mainly because of the difficulties associated with the acquisition of equipment and other resources for the FRP funds. Wholesale trade was not developed during these years and it was more difficult to obtain capital with FRP money than it was through centralized capital investments. Therefore the FRP funds began to be used centrally. Under the conditions of the experiment the FRP was again placed at the disposal of enterprises and it was stipulated --because of the changing policy for planning--that priority be given to material resources for the FRP. The amounts of deductions into the FRP from amortization and profit increased and it was decided to produce them according to stable normatives. It is assumed that this fund will become the main source of funds for technical reequipment and reorganization.

What do the managers of enterprises think about this? The majority of them hold the opinion that the policy adopted for the formation and utilization of the FRP does not satisfy the needs of technical reequipment: this idea was expressed by 51 percent of those questioned in the first round and this proportion increased to 57 percent in the second round. The opinions regarding whether or not this policy would make it possible to acquire the necessary materials and equipment with FRP funds were divided up as follows (percentage).

| | <u>Round I</u> | <u>Round II</u> |
|---------------------------|----------------|-----------------|
| Will make it possible | 41 | 37 |
| Will not make it possible | 48 | 59 |
| No opinion | 11 | 4 |

Such a change in opinions is no accident; in 1985, in spite of the direct instructions concerning priority in the allotment of resources for the FRP, in the electrical equipment industry material coverage of the development funds was at the level of 60 percent. When it is primarily resources that are in short supply that are allotted for the most important state programs, the idea of priority distribution from the center of funds for a multitude of objects of noncentralized capital investments seems unconstructive at best. Rather, it shows a desire to do whatever it takes to maintain funding which clearly impedes technical progress. It is not simply that it takes no less than 2-3 years to obtain the necessary equipment; the worst thing is that it is difficult to order what is necessary and effective precisely for the given enterprise. It is necessary to take whatever they give, and with this the chances of obtaining an effect from the newly introduced equipment decrease sharply.

This is becoming increasingly clear to managers of enterprises as well. In 1984 54 percent of those questioned were convinced that the FRP would be used more effectively if they could direct order the necessary material and equipment from the manufacturers without a need for first obtaining funds and order. In 1985 the proportion of these opinions increased to 66 percent. In the first round, 37 percent of the managers thought that if the FRP did not have complete material coverage it was better to return to the previous policy of centralized distribution of funds for capital investments. In the second round the proportion of these people increased to 45 percent.

The other problem with the acceleration of scientific and technical progress is the incentive and responsibility for the creation of highly effective technical equipment. It would seem that all the necessary conditions have now been created for this, with large bonuses being paid as well as incentive increments to prices. The number of directive indicators and assignments for science and technology is also increasing. But so far no appreciable changes have been observed.

This question was asked: let us assume that the increments to the prices have been abolished and that they are certified for the Emblem of Quality only if they can compete on the world market. Then contractual prices would be used

more widely for new products on the basis of basic price lists. Do you agree that this policy would be better for stimulating a rise in the technical level of items and improvement of their quality? In the first round, 16 percent of those questioned expressed a definite agreement with this policy and just as many were against it, 46 percent fluctuated, but 26 percent of these inclined more toward a positive evaluation and 22 percent expressed no opinion. In the second round there were marked changes. The proportion of those without an opinion decreased to 10 percent while those who were fluctuating remained the same. There were somewhat fewer definite opponents--13 percent, but the proportion of those firmly in favor of this policy increased from 16 to 31 percent, that is, it almost doubled.

Should these evaluations not be interpreted as a vote in favor of the proposed approach? They show quite convincingly a need not simply for improvement, but for changing the present policy.

What Should We Do Next?

This is an earthshaking issue, both for those who are working in the old way and those who have already tasted the joy and enthusiasm of the experiment. Moreover, it is on a completely different plane and is more crucial for the latter than for the former. For those who have not been included in the experiment, the future seems if not altogether clear, at least simple: our turn will come, we shall change over to the new methods (which ones--is another discussion), and then, perhaps, things will be easier. But the participants in the experiment "with tenure" in their evaluations of the final effectiveness of the experiment are evolving in the cautious direction. While at the very beginning of the experiment there was a glowing evaluation of the prospects, a year later these same managers began to exhibit caution. To the question of the possibilities of the experiment in the matter of providing for a qualitative leap in the acceleration of the intensification of production and its increased effectiveness, in the first questionnaire 39 percent gave a categorically positive answer and only 16 percent expressed doubts. But subsequently the number of skeptics jumped to 34 percent, and the enthusiasts decreased by more than half--to 18 percent. Such a metamorphosis is extremely unpleasant primarily because it took place not from outside observers, and not from "cold analysts" who are generalizing a large mass of statistical information concerning the course of the experiment, but from the immediate participants in daily economic life, that segment of managers who are in the thick of things, in the vanguard of the struggle for the success of progressive undertakings.

We can see that the main reason for the cooler attitude toward the experiment is not that it did not justify expectations (although at first glance this is precisely the conclusion one reaches). The main problem is the loss of the tempo. Facilities included in the experiment from the very beginning were regarded as a testing ground for working out certain elements of an essentially new management mechanism. This is precisely the way it was perceived by participants in the experiment from the very beginning as well. Even with the first questionnaire, 86 percent believed that in the near future it would be necessary to take additional large comprehensive measures which would affect the adopted policy of planning, supply and price setting at the

national economic level. Subsequently the number who shared this opinion increased even more (to 93 percent). But in this case the first evaluation is the one that is important.

The majority of management workers saw for themselves the dynamics of the experiment not in the widespread expansion of the group of enterprises changing over to its conditions, but as a process of deep restructuring of the economic sphere surrounding these enterprises and the changes in the interrelations with the ministry, the material and technical supply agencies, the finance-credit system, and so forth. But their hopes were not justified. And it was here that the local character of the experiment became quite obvious. It turned out that its scale is determined by the extent to which it encompasses enterprises, associations and branches and not at all by the comprehensiveness of the solutions to problems of interaction of all elements of the mechanism for management of economic life. In this situation as nowhere else one could see the timeliness of the point in the political report of the CPSU Central Committee to the 27th CPSU Congress concerning the need to change over from particular improvements of the economic mechanism to a radical reform of the system for management of the economy.

From these positions how should one regard the significance of the large amount of work that has already been done for implementing experiments in industry? It would seem that we are dealing with a preliminary "trial" of individual blocks of economic management at the level of the basic cost-accounting unit.

The experiment has done and is doing its job: it has activated economic thinking and once again formed the correctness of the orientation toward qualitative indicators of the development of production, a fruitfulness of searches for methods and forms of providing for motivation of producers to maximally satisfy the demands of the consumers, and it has also given an impetus for expansion of the sphere of effect of economic normatives in planning and management. But the experiment did not set as its goal the solution to a number of radical problems, without which it is impossible to imagine a form of the mechanism for management for public production. This caused the "skidding halt" of the measures in which great hopes had been placed.

First of all there is a quite obvious need to develop new principles of interaction among management agencies along the vertical chain of "Gosplan--Ministry--Association (Enterprise)" both in the process of drawing up plans and in the course of their implementation. The course that has been taken toward strengthening of planning discipline through increasing motivation to fulfill contractual commitments and requirements of consumers for volume, quality and time periods has been directed in depth toward a principal restructuring of the existing subordination "in vertical" interrelations. An increase in the role of the economic agreement in the system of evaluating the results of production activity essentially means increasing the responsibility of the producer, but not to the higher agency, but primarily to the consumer. This idea of the experiment should be developed in all ways. The thesis of the transformation of the economic agreement into the basic planning document for the cost-accounting unit presupposes:

the need to expand the rights of enterprises in the stage of drawing up plans in order to more fully take into account the requirements of the consumers for quality, time periods and conditions for deliveries, an analysis of reserves, a substantiation of the orders for the acquisition of raw materials, equipment and so forth;

notification of centralized planning assignments primarily in the form of state orders that establish mutual commitments, rights and material responsibility of the parties.

An essential unit that determines the effectiveness (or ineffectiveness) of the system of centralized management of the economy is the mechanism for distribution of production resources. We are speaking about the system for material and technical supply.

The restructuring of the system of material and technical supply should be carried out on the basis of extending the principles of complete cost accounting to the sphere of circulation of material production resources. In practice this means that direct administrative distribution of material resources should be consistently replaced with the sale of production funds in keeping with the effective demand of the enterprises. Under these conditions the strengthening of the centralized basis presupposes rigid regulation of financial means that are at the disposal of the clients so that these funds will be distributed in keeping with the planned priorities and the effectiveness of the work of the cost-accounting units. Hence it follows that the restructuring of the system of material and technical supply on the basis of wholesale trade is closely linked to improvement of the financial and credit system.

The changeover to principles of wholesale trade can be carried out in stages and be introduced primarily in the sphere of provision of material resources for monetary funds for the development of the production of associations and enterprises. Among the management workers and scientific workers there is fairly widespread opinion that wholesale trade in means of production can be introduced into practice as the shortages of various kinds of products are eliminated. For items for production and technical purposes that are in short supply it is necessary to retain a "card file" system of distribution. In our opinion, this approach to the problem is not theoretically substantiated and it holds no promise in practice. In reality the so-called shortage of products for production and technical purposes is relative. This is primarily the result of the imbalance of volumes of financing of the activity of enterprises (including internal funds, budget allocations and credit) and their material-substantial coverage. This lack of correspondence can be overcome only through a strict coordination of the financial capabilities of the enterprises with the final results of their economic activity.

This requirement pertains primarily to money from the fund for the development of production. Therefore the real prospects for the development of wholesale trade in means of production is seen primarily in the framework of the "supply of goods" for monetary resources that are earned by the enterprises themselves and are intended for expansion and reconstruction of production, updating of

fixed capital, and the purchase of raw and processed materials of better quality. The money earned for these purposes should be provided with commodities, including new and the latest technical equipment. Naturally, these resources should be produced at contractual prices that take into account the quality of the products and the effective demand of the client enterprises. This form of distribution of high-quality products for production purposes, in our opinion, will be an important factor in ensuring that they are utilized as effectively as possible by the most qualified consumers. For under the conditions of complete cost accounting the increments to the price on which the consumer will agree cannot exceed the economic effectiveness of the products they acquire.

Thus one reaches a conclusion that is directly opposed to the established opinion--it is necessary to trade primarily in products that are in short supply, innovations and products that are produced in experimental batches. It is precisely then that the system of distribution will "work" for all-around intensification and for a maximum return from each ruble that is spent. Of course, this will require consistent restructuring of the entire system of material and technical supply. An equal amount of restructuring will be needed in the agencies for planning, the financial and credit system, accounting and control. This restructuring, even if it is in stages, absolutely must be synchronized throughout all the units and make it possible to provide for integrity and unity when changing over to the mechanism for managing an intensive type of economy.

Further discussion of these issues would lead us too far away from the immediate subject of this article. Therefore, having returned to the materials of the investigation, we will allow ourselves in conclusion to touch upon one quite significant problem of restructuring the system for management of the economy--the restructuring of economic thinking.

The processing and analysis of the information obtained as a result of the questionnaire has made it possible to reveal what were in a certain sense basic "types of economic thinking" of the management staffs of enterprises and associations. It turned out that the consistent proponents of the transformation of the economic mechanism comprised 21 percent of those questioned. These are people who are clearly aware of the interconnections among economic processes and who understand and perceive organically and not merely in words the idea of integrity and the comprehensive nature of the necessary changes in the economic mechanism. Equally consistent are the "conservatives" or "pessimists" who comprise 15.8 percent of the participants in the questionnaire. On all points they hold a position of actual support of the existing methods of management and consider them to be sufficiently logical and consistent. But what about the rest?

A relatively small number (6.5 percent) have no opinion at all regarding questions of improving the economic mechanism (or, for some reason do not wish to express it). And then 56.7 percent, although they expressed themselves very actively have views that are contradictory. There is no consistency in their answers. A representative of this group can, say, give a general positive evaluation to the experiment but in subsequent answers essentially deny the effectiveness of the fundamental elements of the system of planning

and stimulation that is used in the experiment, and so forth. An analysis of the answers of this prevailing group of managers shows the confusion of ideas concerning the direction of the measures that are being taken and the possible ways of overcoming the existing shortcomings.

The high percentage of practical workers with these views should certainly not discourage us. A total understanding of the strategy of the changes in the economic mechanism does not come of its own accord. We need not only the development of an integrated system of management, but also daily propaganda of views that form the system of economic thinking, and direction in the search for reserves for accelerating socioeconomic development that lie in the mechanism of management. Moreover, it is necessary to develop the new type of economic thinking in managers not so much with words as with actions on the part of higher agencies. The practical worker is guided not by an article in a newspaper or even the text of a decree, but instructions created on the basis of this decree. Unfortunately, one of the lessons of the experiment is that certain instructions that have been submitted to the workers did not correspond either to the spirit or to the letter of the directive documents. This kind of "double bookkeeping" generated a "double psychology" for the perception of economic life.

The immense significance of the 27th CPSU Congress consists, in particular, in that it resolutely revealed these negative tendencies. This is extremely important, since we are "just at the beginning of the path. The restructuring of the economic mechanism under the conditions of our country, with its immense and complex economy, takes time and energetic efforts. There can be difficulties and we are not guaranteed that there will be no mistakes, but still the main thing now is to move purposively, step by step, in the chosen direction, augmenting and improving the economic mechanism on the basis of the experience that has been accumulated and eliminating everything that has outlived itself or has not justified itself."

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PRICE-SETTING SYSTEM DISCUSSED

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[Article by V. A. Volkonskiy, doctor of economic sciences, and A. P. Vavilov, candidate of economic sciences, Central Economics and Mathematics Institute of the USSR Academy of Sciences (Moscow): "Prices and Incremental Expenditures"]

[Text] The basis for adopting and substantiating economically effective decisions and cost-accounting [khozraschet] incentives is a system of planned indicators the most important of which are prices.

As we know, in the USSR prices perform not only measurement and incentive functions, but also distributive ones. As a result of the prices reform conducted at the beginning of the 1930's wholesale prices for industrial products were established at the level of their production cost including the minimum profit necessary for the current activity of the enterprises. The state received most of the accumulations in the form of a turnover tax which came from the differences in the levels of wholesale and retail prices. This principle of establishing prices was justified by the need for centralization of all financial resources for their distribution to newly created and rapidly developing branches of industry, the assimilation of new territories, and so forth.

Beginning in the 1960's the measurement function of the price increasingly came into the foreground and in scientific discussions they proved the need to account in the price not only for current expenditures, but also capital expenditures, and also the income from the natural resources that were utilized.

The changes in the understanding of the function of prices can be explained. Under the conditions of intensification of the national economy the main function of prices (this pertains primarily to wholesale and procurement prices) should undoubtedly be recognized as the function of measuring socially necessary expenditures and the effectiveness of the products for the national economy. The other functions of the price are either a direct consequence of its performance of its basic task (for example, the stimulating function) or they can be performed by other economic mechanisms (for example, the redistribution function can be carried out somewhat less successfully by the

financial and credit system. But if in order to perform other functions the price ceases to correctly reflect the socially necessary expenditures, no other economic system can replace it in the performance of this basic task.

There is no need to prove the significance of a reliable system of measurements in our age of technical progress. Not a single machine could be constructed without reliable measurement equipment. And the basis for all economic measurements are prices and evaluations of production resources. If the prices give a distorted picture of the changes in the branch structure of the economy, if they show savings in places where the national economy is sustaining losses and demonstrate losses where in reality there is an effect, there are inevitable mistakes in the planning decisions and a lack of correspondence between the cost-accounting interests of the branches and enterprises, on the one hand, and national economic interests, on the other.

During the past 20 years a good deal has been done to improve the price system as the basic instrument for economic measurements. With a mass revision of prices in 1967 the branch levels of profitability in prices were established taking into account the capital-output ratio of the branch products.

Now it is difficult to find an economist who doubts the need to take capital expenditures into account in prices. Yet in the majority of cases prices still do not take into account the income from natural resources and the existing distribution of production. The need for such accounting is reinforced by the rapid increase in expenditures in extraction branches as a result of the deterioration of the mining and geological conditions for extraction and the shift of production to remote, poorly assimilated regions which have a shortage of labor resources.

This problem is so crucial because of the more general phenomenon of lowering of the price level for products from the fuel and raw material branches as compared to the processing branches. The lower prices do not provide incentives for economizing on raw material and fuel. On the basis of these prices it is impossible to evaluate the national economic effectiveness of resource-saving (especially interbranch) measures, and there is a lack of coordination between prices and planning decisions and national economic and cost-accounting interests. Yet the new edition of the CPSU Program points out: "Scientific and technical progress must be directed toward a radical improvement in the utilization of natural resources, raw materials, processed materials, fuel and energy in all stages--from the extraction and comprehensive processing of raw material to the output and utilization of the final product."

The goal of this article is to substantiate the need for correcting this shortcoming in the existing price system, to reveal its causes, and to suggest methods of eliminating one of these factors, namely the method of determining prices taking rent income into account.

In economic literature a great deal of attention is now being devoted to questions of stimulating the production of new, highly effective kinds of products with the help of prices and the reflection in prices of the consumer qualities of the items, particularly new technical equipment, and greater

flexibility of the price system. Much less frequently does one see the question of the need to solve another problem of price setting, namely further improvement of branch price levels and their ratios. What would you say about a planner who develops a plan for a bridge using indicators of durability of materials that differ from the real ones by a factor of 1.5?... And yet the existing prices for fuel and raw material resources have been reduced by a factor of more than two as compared to the socially necessary expenditures on their production! Planners and designers know that there are many questions of planning and evaluating economic activity where the existing prices cannot be used at all.

The low level of prices for fuel and raw material resources is determined by two basic factors: the difference in the dynamics of the prices for products of fuel-raw material and processing branches (see the section "On the Dynamics of Prices") and the incorrect principle of constructing prices without taking into account rent income from natural resources or the location.

Paradoxes of Existing Prices

In what case can one say that prices are performing their functions? If the evaluations of economic effectiveness based on them do not diverge from the planned decisions and the cost-accounting interests do not diverge from the interests of the national economy.

Let us give some examples that show that in this case the existing prices do not correspond to the plans for the development of the national economy and the calculations based on them can sharply distort the evaluation of national economic effectiveness.

The development of the economy of Siberia (both Western and Eastern), at least for the past three five-year plans, has been taking place at significantly more rapid rates than that of the national economy of the country as a whole. Capital investments are also growing at significantly more rapid rates. Siberia is the main supplier of fuel, timber, nonferrous metals, diamonds and so forth. But with the existing prices the investment of national economic funds in the development of Siberia is ineffective!

The volume of shipments to Siberia from the other regions of the country greatly exceeds the volumes of shipment out of it. Thus in 1977 the import-export balance for Western Siberia, in spite of the fact that it provided for half of the extraction of hydrocarbon raw material, was negative and amounted to 10.1 percent of its final product. The "losses" in Siberia are necessary in serious research, which is impossible without a reliable apparatus for economic measurements. According to our calculations, in prices which include rent, the balance of imports and exports for Western Siberia during this same era of 1977 amount to a great positive amount--about 20 percent of the volume of imports!

The sharply reduced prices for petroleum make it impossible to use them when evaluating the effectiveness of measures for the development of its extraction and more economical utilization.

Since for the majority of deposits that have been discovered expenditures are higher than wholesale prices, the application of these prices for selecting the sequence of their development leads to incorrect conclusions concerning the sequence of the development of small and not large deposits (this minimizes losses). The utilization of reduced prices for oil leads to an incorrect evaluation of the relative economic effectiveness of variants of the development of deposits, giving priority to variants with smaller volumes of extracted petroleum. New technology for extraction which increases the percentage of extraction of oil from the earth turns out to be ineffective. It is known that more efficient utilization of petroleum requires the development of processes for its secondary processing. Under the conditions of the limited supplies of inexpensive fuel, the main path to intensification of its utilization consists in increasing the depths of its processing and rapidly increasing capacities for secondary processing. Nonetheless, during 1960-1980 the depth of processing has decreased. The arrears in the growth of capacities for secondary processing of petroleum has been compensated for by high rates of its extraction, which can hardly be considered economically justified, taking into account the exceptionally rapid growth of expenditures on extraction.

It is natural to assume that one of the reasons for this nonoptimal strategy consists in the lower prices for petroleum that camouflage the real ratio between expenditures on extraction and processing and do not take into account the high proportion of rent income for petroleum supplies. According to existing wholesale prices, to obtain an additional ton of light petroleum products from additional petroleum and its initial processing costs less than half as much as secondary processing (with the replacement of fuel oil with gas or coal). Calculations on the basis of prices that take into account rent revenue show that expansion of secondary processing is much more advantageous for the national economy than extraction and initial processing. In 1982 the prices for petroleum were increased by a factor of 2.2, but nonetheless the situation did not change: the price of petroleum as before was significantly less than the socially necessary expenditures.

Concerning Price Dynamics

One of the factors that bring about the lower level of prices for products from fuel and raw material branches as compared to the processing branches is the significant difference in the price dynamics for products of these two groups of branches during the periods between mass revisions of prices. Centralized control over the movement of the average price level varies in strictness and effectiveness for various types of production and groups of products. It is most effective for single-product productions or for branches that produce mass homogeneous products (for example, for branches of the fuel and energy complex). Prices for these kinds of products are changed strictly centrally. Conversely, for productions with many products and a high level of renewability of products the possibilities of centralized regulation of the price level are limited.

In official price indexes for groups of items that are published by the central statistical administration, when calculating the index for the year they take into account the change in prices only of those items that had been

produced in the past year. New products are accounted for as products with a price that has not changed throughout the year.

But it is possible to have an indirect evaluation of price indexes for large groups of products through the dynamics of expenditures on the production of homogeneous kinds of representative items or through the interconnection of technical and economic indicators that characterize to an equal degree all industrially developed countries. Each of these methods has its shortcomings, but makes it possible to evaluate approximately the rates of movement of prices that do not correspond to changes in the consumer qualities of the products.

The published results of research show that the prices of many kinds of machines and equipment increase at more rapid rates than their productivity does. At the same time, prices for fuel, energy and metals during the period during mass price revisions in 1967 and 1982 remained practically the same.

Differences in the dynamics of prices for products of various branches of the national economy and industry find indirect confirmation in the dynamics of proportional expenditures and profit per unit of products produced during periods between sequential price revisions. Let us consider the indicator of the proportion of profit in the commercial product (in current prices) for the last decade. In machine building and light, the chemical and the petrochemical industry this indicator remains stable (or more precisely, it fluctuated around a stable level) or even increased slightly. But in the coal, petroleum and gas, timber, wood-processing and pulp and paper industry, the construction materials industry and in ferrous and nonferrous metallurgy there was a steady reduction.

Disproportions reflected in the lower level of prices for products of the fuel and raw material branches are corrected only when there are mass revisions of prices. Since these recalculations take place rarely (15 years passed between the two sequential recalculations in 1967 and 1982), the accumulated disproportions reach extremely significant amounts. This is shown by the very scale of the changes in price levels in 1967 and 1982.

Thus the level of new prices in 1982 and the coal industry was higher than the old level by an average of 48.9 percent, in ferrous metallurgy--19 percent, and in the timber procurement industry--43 percent. At the same time the price level for products of branches with many types of products like machine building and light industry remained practically stable. Analogous ratios characterize the recalculation of prices in 1967.

One cannot think that as a result of mass recalculations of the level of wholesale prices their ratios end up corresponding at least to the average branch expenditures. Thus the profitability of the coal industry remained negative after the introduction of new prices in 1982. But even if one admits that these ratios are acceptable, they remain so only for the first couple of years after the mass recalculations. After 4-5 years they already significantly distort the picture of the real national economic expenditures. By the end of a 15-year period the prices for fuel and raw material kinds of products end up being reduced by 40-60 percent.

Average or Incremental?

For several decades there has been a debate among Soviet economists about whether prices should be constructed on the basis of average or extreme (incremental) expenditures. For branches involving the utilization of nature this is tantamount to the question of whether or not to include the revenue for natural resources in the price. K. Marx explains in detail in "Das Kapital" how the differential rent is formed. While the prices determined by the production expenditures on the worst land, that is, the extreme expenditures, on the best and average lands and additional income, the rent income, is formed.

Opponents of accounting for rent in prices in the socialist economy think that this accounting would violate the value principle of price construction. (Footnote 1) If current material and labor expenditures and also profit and the proportional capital-output ratio of the products reflect expenditures of live and past labor (including added labor)--they think--then what labor expenditures would rent correspond to?...

Marx showed that when a price is formed in a developed capitalist economy the value is modified. There is a redistribution of the added labor in keeping with the amount of capital advanced for production in various branches of the economy and also in keeping with rent paid by the capitalist to the landowner. Thus the price does not lose its value character or its value essence. "The price reflects socially necessary expenditures on increasing the production of a given commodity and not the average expenditures on the production of the entire mass of it." (Footnote 2) An evaluation of a limited resource during this period (reproduced or not reproduced) in this modification of value is equal to expenditures of labor to compensate for the limited resource through the utilization of alternative technologies that can do without this resource (in the terminology of V. V. Novozhilov--"expenditures of reverse connection").

In order to serve as an instrument for measuring the economic effectiveness of economic measures, the price should show which additional expenditures will be made by the national economy in order to obtain an additional unit of product (say, an additional million tons of coal or metal) or which additional resources it will receive if it manages to save this unit of product and not make the corresponding capital and current expenditures. In other words, the price should reflect the incremental expenditures on production." (Footnote 3)

Let us consider as an example the evaluation of the economic effectiveness of a measure that consists in reducing the expenditure of grain in the quality of feeds in animal husbandry as a result of the development of the mixed feed industry. If the grain that is saved is taken into account according to the average expenditures in the country for the production of one quintal, the evaluation of the effect will decrease sharply since the reduction of the need for grain makes it possible to reduce the areas planted in it, for example, in Arkhangelsk Oblast where expenditures are twice as great as the average, while in the Northern Caucasus a reduction of its production is, of course, inexpedient.

In branches involving the utilization of nature, as a rule, the level of incremental expenditures is determined by the deposits for sections of land with the worst production conditions. But this is not a general rule. In particular, if the concept of incremental expenditures is applied to the processing industry, where the level of expenditures is determined not by the restrictions in terms of natural resources (with differing levels of accessibility and so forth) but by the progressiveness of technology and the quality of technical equipment, then the incremental expenditures must be determined according to the best and not according to the worst conditions for production.

A complicated question is the degree of natural expenditures with fluctuations in the necessary volumes of output and conditions for production. In five-year and long-range plans the dynamics of normatives of expenditures within the 5-year period usually cannot be taken into account because of the significant indeterminacy of many parameters. Therefore the price level and the incremental expenditures, apparently, should be considered stable for each five-year plan.

In keeping with this, for the majority of extraction branches the incremental expenditures can be determined as expenditures on production capacities introduced during the given five-year plan.

An immediate changeover to prices constructed on the basis of incremental expenditures involves certain difficulties (see below).

Therefore in the majority of cases the utilization of nature for a number of years now normatives of closed or incremental expenditures (NPZ) are calculated and used for substantiation of intrabranh planning and projection decisions and, in particular, a large amount of experience has been accumulated in branches of the fuel and energy complex.

But the basic reserves for increasing the effectiveness of the national economy are linked to measures that are of an interbranch nature. An adequate evaluation of the economic effectiveness of all resource-saving technologies requires a comparative evaluation of the resources that is saved with the increasing labor and capital expenditures and to do this it is not enough to have intrabranh calculations of closed expenditures that do not take into account interbranch relations. The utilization of the interbranch NPZ's is an important step forward in the improvement of methods of economic measurements. But it bears clear traces of departmental favoritism that have been transferred over to the sphere of price setting. At the present time there is a possibility of beginning to develop and utilize the NPZ for long-range planning and projection calculations on the scale of the entire national economy.

The Dynamic Rent and Interchangeability

Recently, because of the exhaustion of easily accessible and "cheap" supplies of petroleum, a great deal of significance has been attached to another factor which is not taken into account in the traditional statistical schema described above but exerts a decisive influence on the level of normatives of incremental expenditures of such resources as petroleum and gas. This factor is in effect in all extraction branches of industry where the production involves permanent extraction of a limited supply (limited for the given deposit or region) of a certain resource and the production conditions deteriorate (and expenditures increase) as the volume that is extracted increases.

At the present time the production of an additional quantity of resources with the same level of extraction in future years will require not only added expenditures for prospecting and extraction of this same quantity, but also an increase in future added expenditures because of the earlier changeover to worse production conditions. This additional constituent of incremental expenditures plays a significant role in those extraction branches where expenditures on prospecting, extraction and transportation are increasing rapidly because of the reduction of supplies in the deposits and rayons that have more favorable conditions. This has been given the name dynamic rent. (Footnote 4)

For interchangeable kinds of products the NPZ like the prices are determined not by expenditures on the production of each of them individually but by that which is supposed to cover the possible changes in the overall demand in the total volume of the entire group of interchangeable kinds of products (the closing product). If there are no limitations on the expansion (with the same expenditures) of production for these or other products in the group, then the prices at the NPZ should be determined by the expenditures on the product that is the least expensive for the national economy. If the production of inexpensive items is limited, then the prices in the NPZ are determined by the expenditures of the more expensive of the products (the expansion of whose production is not limited).

A similar influence on the selection of the closing resource is exerted by the possibilities of the consumer's changing over from one resource to another, that is, the limitations on the interchangeability if they exist. Thus the question of the selection of the closing resource which sets the level of the prices or NPZ for the entire group of interchangeable products depends on the "limit conditions" that reflect the possibilities of expanding production and consumption of each of the resources of the group with the same effectiveness.

With retrospective calculations, if one pays attention to the actually created production capacities of the producers and consumers of each of the resources, there are no possibilities of variation and, consequently, one cannot take into account the conditions for interchangeability in the NPZ or prices. In other words, with retrospective calculations the concept of the NPZ becomes conventional, depending on the presuppositions that are made concerning the possibilities of variation.

The classic example of interchangeability are energy bearers and electric energy. At the beginning of the 1970's the predominant fuel both for the European and for the Asian parts of the USSR was coal. Although natural resource expenditures were less for gas than for coal, the proportion of gas in the overall extraction of energy bearers in the country was only about 20 percent at that time and the expansion of capacities for extracting gas under the 11th Five-Year Plan proceeded at a maximum rate of 8 percent per year. Therefore possible changes in the consumption of energy could not be covered by forcing the extraction of gas.

During the 1980's in the Asian part of the Soviet Union the predominant fuel continued to be coal (after the reduction of expenditures on coal in the Asiatic part, there was development of deposits discovered in the Ekibastuz, Kansk-Achinsk and Kuznets basins). In the European part gas continued to be less expensive. Additionally, under the 11th Five-Year Plan the possibilities of extraction in transportation of gas to the European part could no longer be considered the basic limitation on the growth of its consumption. A no less serious obstacle was the lack of preparation of the consumer branches themselves for changing over to the utilization of gas instead of fuel oil and coal. On the basis of these considerations, we used gas in our calculations as the predominant fuel for the European part of the country and coal for the Asiatic part.

The establishment of NPZ for energy bearers in terms of the expenditures on extraction and transportation of gas should, in particular, lead to the conclusion that it is effective to reduce the extraction of energy coals and their transportation to the European part and to replace them with gas in the energy balance. Should this conclusion be considered mandatory and should one adhere to this policy in planning calculations? Apparently only under the condition that there are no factors that dictate that the volumes of coal extraction should be increased or at least maintained at the level that has been reached. But rapid growth of expenditures on the extraction and transportation of petroleum and gas can in the near future lead to a situation in which coal in the European part is less expensive than gas and it will be necessary to increase its extraction again. The difficulties, mainly social ones, related to the reduction and subsequent increase in the extraction cause one to prefer the variant of development (possibly less economical) that presupposes maintaining the extraction at the current level.

Of course this does not mean that the current level should be retained in every basin. The "less expensive" basins should be developed while coal extraction should be reduced at the "expensive" ones. The establishment of the NPZ per ton of coal on the basis of its interchangeability of gas leads to a situation where in a number of coal deposits they will be covered by calculated expenditures on the extraction and transportation, although on an average for the branch there is even a certain level of rent. In the future the predominant source of energy in the European part could be electric energy produced at GES's or other electric power stations.

Incremental Expenditures on Petroleum and Products From Its Processing

Petroleum and products from its processing occupy a special place among the fuel and energy resources because of the possibilities of their utilization for engine fuel and raw material for the chemical and petrochemical industry, and their relatively easy transportability and high export value.

In calculations of the NPZ and in existing price setting the principle of interchangeability of petroleum products as energy bearers is taken into account only with respect to fuel oil and other dark petroleum products. The value of the NPZ for fuel oil is then used to calculate the NPZ of motor fuels and crude oil based on the equality of expenditure characteristics (NPZ) of the products at the beginning and end of the processes of initial processing of petroleum and cracking oil. The assignment for one of the NPZ's--fuel oil or crude oil--simply determines the value of the other.

The situation at the end of the 1960's and beginning of the 1970's can be characterized by the following features. The volume of the extraction of petroleum was sufficient to cover the needs of the national economy for engine fuel through initial processing alone, practically without the application of secondary processes, not the entire volume of crude oil but only part of it was processed, and the NPZ was lower than the NPZ for gas and coal. In this case the value of the crude oil like that of pure oil is determined by their utilization as boiler fuel, and the NPZ of a ton of petroleum and a ton of fuel oil are the same. Then because of the low expenditures on extraction, petroleum and fuel oil were the "least expensive" energy bearers.

At the present time the picture has changed radically: the limitation on the extracted supplies has become a real factor which must be taken into account in planning.

Because of the high growth rates of expenditures on the extraction of petroleum, the level of incremental expenditures on the production and transportation of fuel oil (taking into account the dynamic rent in petroleum extraction) even in 1982 turned out to be higher than the incremental expenditures on coal and gas in the European part of the country by approximately 8 percent (Footnote 5) (this difference increased even more after that). Therefore the calculations of the NPZ for petroleum through the ratio of interchangeability of fuel oil, on the one hand, and coal and gas, on the other, give values of the NPZ of petroleum that are lower than they are when they are calculated on the basis of expenditures on the extraction and transportation of petroleum. NPZs figured on the basis of interchangeability show the effectiveness for the national economy of eliminating petroleum and fuel oil from the balance of boiler and furnace fuel and replacing them with gas and coal. The export value of petroleum also shows that the principle of energy interchangeability is unacceptable for petroleum. Therefore the NPZ's for petroleum and petroleum products should be established at a higher level, on the basis of expenditures on the extraction, transportation and processing of petroleum (without taking into account its interchangeability with other

energy bearers). Then the average levels of the NPZ's for fuel oil and engine fuel are determined from equations of expenditures and the results for processes of initial processing of petroleum and cracking oil.

Calculations Show....

As has already been stated, the normatives of closing (incremental) expenditures calculated at the present time in individual raw material branches and the fuel and energy complex, as a rule, cannot be used for evaluating the economic effectiveness and the substantiation of measures that are of an interbranch nature, particularly resource-saving measures. For a correct evaluation of the effectiveness of these measures it is necessary to have an NPZ system that encompasses all the basic kinds of products in the national economy that is constructed taking into account interbranch mutual influences. In order to calculate the branch levels of these normatives (NPZ's) the TsEMI of the USSR Academy of Sciences constructed an interbranch model in which average branch expenditures have been replaced by incremental ones for various branches that utilize nature.

Calculations according to this model show that the overall level of the NPZ turns out to be higher by a factor of 1.14-1.24 than the level of existing wholesale prices that are calculated in terms of the national income. The rent comprises 15-20 percent of the national income calculated according to the NPZ. The amount by which the overall level of the NPZ is higher than the wholesale prices with the same level of wages shows a significant underestimation in the system of existing prices of all material resources of the society, that is, past labor as compared to live labor. This corresponds to the overall tendency to consider the main measurement of effectiveness of economic activity to be increased productivity only of live labor. As we know, measures for providing incentive to economize on material resources with the help of limits and special forms of bonuses began to be used relatively recently. The amounts of the overall underestimation of material expenditures revealed in our calculations show the real value for the national economy of economizing on resources.

Incremental, Average Calculated Expenditures on Extraction,
Transportation of Products of Fuel-Energy Complex (with
Normative of Effectiveness of $E = 0.1$)

| <u>Name of Energy Bearer</u> | <u>Ratio Between Incremental and Average Expenditures</u> | <u>Growth of</u> | |
|---------------------------------|---|---|---|
| | | <u>Incremental Expenditures, Taking Into Account Interbranch Interactions</u> | <u>Incremental Expenditures, Taking Into Account Interbranch Interactions</u> |
| Coal (in European part of USSR) | 1.39 | 1.19 | 48.7 |
| Coal (in Asiatic part of USSR) | 1.34 | 1.45 | 28.9 |
| Gas (in European part of USSR) | 1.44 | 1.26 | 48.7 |
| Gas (in Asiatic part of USSR) | 1.44 | 1.28 | 28.9 |
| Petroleum | 2.74 | 1.21 | 66.7 |
| Fuel Oil | -- | 1.18 | 52.8 |

The NPZ significantly exceeds the level of existing prices for the branches in which the model includes rent and also for the food industry (as a result of the higher level of the NPZ for agricultural products) and partially for branches of the infrastructure (transportation and communications, trade, material and technical supply, and procurement).

For the other branches, the level of the NPZ is significantly closer to the levels of existing prices. Thus the ratio between the NPZ for fuel and the NPZ for machine building and metal-processing products turns out to be almost twice as great as the ratio between the corresponding wholesale prices. The NPZ for light industry products turns out to be 20 percent less than the existing retail prices, but for food products it is 33 percent higher. This corresponds to the significant proportion of the turnover tax and the high profitability in prices for light industry products and also the large volume of payments from the state budget that covered the difference between the procurement prices for agricultural products and the low retail prices for the corresponding food industry products.

The high level of rent and incremental expenditures on products of the extraction branches and agriculture show the great reserves for increasing the effectiveness of the national economy that lie in improving interbranch proportions and changing over to resource-saving technology. Such a changeover makes it possible to reduce the rates of expansion of the production of the primary resources and refrain from utilizing less effective land and mineral deposits or to release additional resources for export. As a result of this the level of incremental expenditures in a number of branches, especially in agriculture, should approach the level of average expenditures, and the proportion of rent should decrease.

Considerably more complicated than the application of the NPZ in planning and projection calculations is the problem of improving the levels and ratio of existing prices. The basic difficulty lies in the high level of the NPZ for

products of agriculture and the food industry that come to retail trade (approximately 35 percent higher than the existing procurement and retail prices). The establishment of wholesale and procurement prices at the level of the NPZ would lead to the need for a sharp increase in subsidies to retail prices or to the need for a simultaneous significant restructuring of the system of retail prices for goods and services as well as the structure of monetary incomes of the population.

At the same time, the significant disparity between the ratios and the overall level (with respect to wages) of existing wholesale and procurement prices, on the one hand, and the NPZ, on the other, can give rise to a distortion of interbranch proportions and a reduction of the effectiveness of the production structure.

Therefore in parallel to the process of restructuring public production, which leads to bringing the levels of incremental and average expenditures closer together, primarily in agriculture, it is necessary to earmark and implement a strategy of consistently bringing existing wholesale prices closer to normatives of incremental expenditures in terms of their structures and ratios.

In the first stage it is the necessary restructuring of prices, in the opinion of the authors, can be limited simply to the task of accounting for rent in the branches of the fuel and energy complex, but after that it must be extended to products of agriculture and other branches that utilize nature.

FOOTNOTES

1. See, for example, Yu. V. Yakovets, "Tsena v planovom khozyaystve" [The Price in a Planned Economy], Moscow, "Ekonomika", 1974, p 148.
2. Novozhilov, V. V., "Problemy izmereniya zatrat i rezultatov pri optimalnom planirovanii" [Problems of Measuring Expenditures and Results With Optimal Planning], Moscow, "Ekonomika", 1967, p 320.
3. Since in these expenditures one must take into account both current and capital constituents, we are speaking about calculated expenditures.
4. For more detail see, for example, Vavilov, A. P., Volkonskiy, V. A., Kuzovkin, A. I., Pavlov, N. Z., Petrakov, N. Ya., Solovyev, Yu. P., and Yasin, Ye. G., "Methods of Accounting for Rent in Prices and Planning Calculations," EKONOMIKA I MATEMATICHESKIYE METODY, No 5, 1986.
5. The value for $E = 0.1$ is given. With $E = 0.8$ the NPZ for fuel oil is 40 percent higher than the NPZ's for coal and gas.

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CONTRACT APPLIED IN LARGER COLLECTIVES

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 54-68

[Notes from All-Union Scientific-Practical Conference, prepared by Ye. Lysaya and L. Shcherbakova: "The Collective Contract and Acceleration of the Rates of Socioeconomic Development"; first paragraph EKO introduction]

[Text] Under the 12th Five-Year Plan there is to be extensive dissemination of collective forms of organization of labor, including the collective contract. Because of this EKO readers are paying a good deal of attention to the Novosibirsk experience in applying the collective contract in large production subdivisions. We have already written about this (see "Second Breath for the Contract," No 1, 1986). But the readers are still interested and we are returning to this subject again.

In the evolution of collective labor processes the present day is characterized by extending the contract to larger and larger collectives and including in them, along with the basic workers, auxiliary and service personnel, engineering and technical personnel who are directly involved in the activity of the given labor collective. And this is quite legitimate, since the direction of collectives toward the final results in their material responsibility and interest cannot be fully realized in small subdivisions. The best possibilities of technological, organizational and, consequently, also economic collectivization of contracting collectives can be provided only at the level of sections, shops and other larger structural subdivisions.

The All-Union Scientific and Practical Conference that took place in Novosibirsk devoted to problems and tasks of the development of the collective contract and its role in the acceleration of the country's socioeconomic development. Participating in it were managers and specialists of ministries and departments, enterprises and associations, and also party and trade union workers and scientists.

The dialectic of the contract consists in that through it it is possible to have more complete realization of cost accounting in intraproduction relations and the creation of prerequisites for changing associations and enterprises over to complete cost accounting. All this makes it possible to draw the conclusion contained in the report by the deputy chairman of the USSR Council

of Ministers, Yu. P. Batalin (at that time he was chairman of the state committee for labor and social problems) and in the statements made by Academician A. G. Aganbegyan; the director of the Scientific Research Institute of Labor, doctor of economic sciences Ye. G. Antosenkov; the director of the scientific center of the AUCCTU, Dr of Economic Sciences S. I. Shkurko, and several other participants: the collective contract is a most important means of passing new management principles from above to below, to the primary labor collective and the work place. We are speaking primarily about gradually increasing independence, expanding rights, and on the basis of this, increasing the responsibility of labor collectives at all levels for the results of their work.

The contract has been applied in large labor collectives in Novosibirsk Oblast on a broader scale than anywhere else. EKO has already written about the Novosibirsk Experiment. Let us just recall the basic features of the organization of the collective contract at enterprises of Novosibirsk.

The collective form of organization and payment for labor is applied at higher levels than the brigade--in large production sections, technological flow lines, and shops. It is assumed that in the future it will be applied in productions and entire enterprises.

The contract collectives include all workers of the subdivision which has been changed over to the contract (basic and auxiliary workers, service personnel, engineering and technical personnel, and employees).

In the experiment they are testing a principally new mechanism for material incentives which is based on the collective normative-bonus system of wages which is the same for all categories of workers (including engineering and technical personnel).

Production activity is based on a contract with the administration. This should be based on principles of cost accounting relations both with the administration and with associated productions.

Not everything that was thought of in the Novosibirsk Experiment turned out, they did not manage to realize everything, although the overall results turned out to be positive. The majority of participants in the experiment of contracting collectives achieved an increase in the volumes of production and especially of labor productivity, and the growth rates were higher by an average factor of 2-2.5 than in the enterprise as a whole.

For example, the productivity of grain crops in the shop contracting for crop growing in the Priobskiy Sovkhoz was higher by an average factor of 1.5 than it was in the rayon as a whole. Here one should note that the contracting collectives did not have any advantages in material and technical supply and they also suffered from interruptions in it just as the others did.

But there were also collectives that did not utilize the advantages of the contract forms of labor organization over the traditional ones, and they exerted no appreciable influence on the results of the work of the enterprise as a whole. The analysis in the report and statements of the tendencies in

the development of large contracting collectives and the problems and difficulties that arise makes it possible to draw certain conclusions.

A Formulaic Approach Can Compromise an Important Cause

As practice has shown, the greatest effect from the introduction of contract methods of management can be achieved in places where questions of the organization of labor, production and management, the activization of the human factor, and improvement of the economic mechanism are resolved in a comprehensive and interconnected way. A formulaic approach to the creation of contract collectives, without careful preliminary preparation, can compromise an important cause. And in some places they have not managed to avoid this.

The changeover of collectives to a contract frequently requires changes in the distribution of equipment, redesigning premises, and sometimes even rearranging the technological process. Individual changes involve additional expenditures. But when people ignore organizational and technical preparation and do not want to make the necessary expenditures, contract methods turn out to be ineffective. The development of the contract is not a regular campaign but a strategic, long-term direction for work. One should not shrink in the face of additional expenditures in order to obtain the effect.

"Organizational-technological collectivization of local collectives makes it possible to depart from operation-by-operation payment for labor, to introduce consolidated norms and rates, to make the formation of collective earnings dependent on the final result, and, on the basis of this, to transform contract collectives into the basic unit of economic relations at the enterprise. Thus the principle of collectivism receives technical-technological, organizational and economic support, which contributes to significantly increasing the effectiveness of the work of contracting collectives." (From the report of Yu. P. Batalin.)

It would be expedient for the organization of the contract collective to be preceded by certification and streamlining of work places and technological processes.

A necessary condition for extensive application of contract principles is improvement of norm setting. The decree of the CPSU Central Committee, the USSR Council of Ministers and the AUCCTU, "On Improving the Organization of Wages and Introducing New Wage Rates and Salaries for Workers of Production Branches of the National Economy," envisions the development and extensive application of consolidated norms for the completed complex of work, items, stage, or object of construction.

But is there a possibility of achieving high individual results in a contract collective? Is the principle of "From each according to his ability" fully realized there? As practice shows, not yet. We have not found forms of revealing and providing incentive for leaders and we have not created conditions for taking advantage of their experience, skills and work method. Yet "only equaling the highest achievements will make it possible to orient collective labor not toward the average level, but toward consistent development of the capabilities of workers and, on the basis of this, toward

the achievement of highest production indicators" (from the report of Yu. P. Batalin).

Not to forfeit individual mastery and to assist in the development of personal creative potential comprise a serious problem of which today is not being resolved successfully enough. It is no accident that frequently the most qualified workers resist the organization of contract collectives.

Dr of Economic Sciences S. I. Shkurko thinks that it is exceptionally important to inform all structural subdivisions of indicators of the plan that are compiled and introduced within the framework of the association or enterprise since only when it is possible to guarantee the fulfillment of planning indicators and contractual commitments for the production as a whole will it be possible to have a correct evaluation of the activity of the structural subdivisions and the formation of substantiated wage and incentive funds. This approach to planning links in the closest way the results of the labor of the contract collective and the final result of the work of the enterprise or association. But this has not yet been sufficiently developed. And this is also one of the serious problems of the collective contract. Its resolution depends on restructuring of management and planning in the enterprise or association as a whole.

When Orientation Toward the Final Result is Maintained

One of the radical advantages of the collective contract is that it has become possible to introduce single principles of organization for wages for all categories of personnel: piece-rate workers, time-rate workers, and engineering and technical workers. The results of the Novosibirsk experiment showed that at the level of the sections as a whole it was a good idea to have a unified normative for the formation of the wage fund of the contract collective, which is determined on the basis of progressive norms of labor expenditures, wage rates of workers and salaries of engineering and technical personnel. This issue has not yet been completely resolved for the introduction of the contract at the level of shops and enterprises. Now most frequently two normatives are used for the formation of the wage fund: different ones for workers and for engineering and technical personnel. Here the unity of interests is achieved by the fact that both normatives are determined by the final result of the work of the entire contract collective.

In the speeches it was noted that in certain contract collectives, along with consolidated comprehensive norms, they still account for individual output. Frequently the collectives themselves establish the output norms, which, in their opinion, reflect more precisely the real expenditures of labor of the workers, especially in places where members of the collective have not worked their hardest and where there are significant differences in the qualifications of workers and in their attitudes toward their work. Experience has shown that with the introduction of individual accounting for output, its application is successful in places where the initiators of this accounting were the labor collectives themselves.

A most important requirement for improvement of intraplant cost accounting is providing for the priority of the collective interest of the association.

(enterprise) over the interests of its structural subdivisions. As S. I. Shkurko noted in his statements, the mechanism of intraplant management and, consequently, any contractual relations, should be constructed in such a way that the collective interest of the association (enterprise) could be mediated through the level (unit) of intraplant management. From these positions with respect to each unit of administration it is necessary to solve problems of the plant, the evaluation of work, and the payment and incentives for labor. Otherwise the activity of the contract collectives can be in contradiction to the overall tasks of development of production.

Hence the most important distinguishing feature of their work is the establishment of stable economic normatives that determine the volume of funds for wages. The stability and long-term nature of the normatives for the deduction of funds are still not always correctly understood, as S. I. Shkurko emphasizes. They can be stable and long-term only under the condition of the stabilization of production when the actual conditions correspond to those planned. A weakening of the incentive of collectives to further improve the results of their work is explained not by the fact that the normatives are being revised but by the fact that they are being revised irrespective of any previously established quantitative proportions between the movement of normatives and the movement of indicators that characterize production. It is very important to extend the normative method of forming the wage fund to all structural subdivisions, including the staff for management of the association (enterprise) since the staff workers should be interested in the same thing as the entire collective is interested in.

Improving Collective Wages

A most important issue in the wages of contract collectives consists in how to distribute the collective earnings for the final result among its members so as to provide for a correct combination of collectives and individual material interest in achieving high results. In the majority of cases this task is now resolved through organizing work under a unified contract with payment according to the final results and distribution of earnings in keeping with the coefficient of labor participation. There are various attitudes toward the KTU [coefficient of labor participation]. As the director of the Elektrosignal plant, F. F. Shevelev thinks, when it is applied correctly there is a marked reduction of losses of working time, the intensiveness of labor increases, discipline and mutual assistance becomes stronger and, consequently, labor productivity increases. But at the same time there is a need for additional extensive research into the practice and forms of application of the KTU taking into account its economic, social and psychological aspects.

From the report of Yu. P. Batalin: "My personal experience and research conducted by a number of scientific research organizations show that in stable collectives that have been working together for a long time, individual output and, consequently, also earnings gradually equalize. The equalization of the earnings of the members of a contract collective is explained primarily by the fact that the basic effect from the standpoint of labor productivity at the first stage is achieved as a result of bringing the lagging ones up to the level of the members of the contract collective who are working well. Under

these conditions the main function of the KTU is to maintain high technological, production, and labor discipline."

Practice shows that so far the system of payment according to the final result with the application of the KTU is the only method of more objective establishment of wages for various categories of workers. F. F. Shevelev thinks that the KTU practically eliminates injustice, whereby the more skilled workers (fitters for equipment, stamp installers, engineering and technical personnel, foremen and technologists) receive smaller wages than the average worker.

The fear that engineering and technical personnel and service personnel will spend less time dealing with problems of the prospects for the development of the section is groundless, since without the introduction of new technological processes and preventive maintenance of equipment it will be impossible to have the necessary growth of the volumes of production and, consequently, wages will decline. The system in effect at the Elektrosignal Plant envisions automatic reduction of the KTU for this category of workers when they perform their basic functions. Thus the technologist is responsible for fulfilling the plan for reducing labor-intensiveness. When it is not fulfilled the bonus automatically decreases. On an average for the plant the level of wages of auxiliary workers and engineering and technical personnel in contract sections is 10-15 percent higher than at analogous sections, without contracts, but both the growth rates of the volumes and productivity are also higher here.

In a contract collective wages are distributed more objectively among piece-rate workers, since there are no advantageous or disadvantageous jobs--wages depend on the final result. In order for this not to lead a deterioration of the quality of norm-setting, the plant devotes a great deal of attention to the introduction of technically substantiated output norms. On an average for the enterprise they amount to 83 percent of the norms, and in the stamp shop, where all sections are under contract, their percentage is equal to 98, in the automatic revolver shop--85.2, and in the section for printed plates--96.3 percent. The brigade leader-foremen of many sections account for the earnings of the workers and then make suggestions for refining the KTU. A task is being raised for introducing consolidated norms.

The determination of the personal contribution of each member of the contract collective to the final result of the labor is a most complex and even painful issue. Therefore we are doing much research here. We have, for example, the experience of the Inskaya Station of the Western Siberian Railroad. Here the individual contribution is determined using the coefficient of difficulty and labor participation. The need for a coefficient of difficulty of labor arose because of the fact that before the beginning of the experiment the amounts of the bonus according to the position of the workers of various units of the shift were different and ranged from 15 to 40 percent of the wage rate (salary).

As V. A. Gorbunova, deputy general director of the Ob' Leather Footwear Production Association noted, the wages for workers of the contract collective are taken from a unified fund here which is made up of two parts. One is formed according to the normative of wages per unit of volume of products

produced (basic wages). The second includes all kinds of bonuses calculated for the collective (additional earnings). The normative of the wages per unit of output or volume of work is determined by the ratio of the sum of the revised fund, wage rates for piece-rate workers and salaries for engineering and technical personnel, on the one hand, and the planned volume of production, on the other. The normative is established so that it is stable for 2 years or 1 year, taking into account the assignment for reducing labor-intensiveness. A revision of the norm is carried out only as organizational and technical measures are introduced. The savings on the wage fund obtained from above-plan reduction of labor-intensiveness, are distributed according to the KTU in the collective.

Bonuses for labor collectives of contract sections are awarded here according to indicators that are the same for the entire collective and reflect the final results of their activity. The distribution of collective earnings among workers is done in keeping with wage rates, salaries of engineering and technical personnel and the actual amount of time worked, taking into account the individual contribution of each worker using the KTU. By a decision of the general meeting, taking the KTU into account, they distribute all kinds of collective earnings, bonuses and savings on the wage fund obtained by working with fewer personnel.

The statements made at the conference make it possible to draw the conclusion that the most radical condition for stimulating the work of the contract collective is payment in the form of a share of the product that is produced or the final result. In a collective contract it should be constructed on three principles: more rapid growth of the variable part of wages that depend on a personal contribution of each person over the guaranteed part; direct dependence of the earnings on the final result and the scale of what has been done; and collective distribution of what has been earned.

The conference showed that not everything has been resolved with respect to the collective wage fund and its distribution. In certain contract collectives wages are increasing more rapidly than labor productivity is. An analysis revealed that this picture comes about in those collectives that have not developed cost-accounting principles, are introducing them poorly, or are not introducing them at all.

In general questions of cost accounting are pivotal when introducing the collective contract, but also less developed than all the rest.

A Knot of Unsolved Problems

The greatest difficulties, in the opinion of participants in the conference, are related to the practical application of the system of material responsibility for the results of the work. In the Novosibirsk Experiment this system is envisioned in the provisions concerning the contract but it amounts basically to taking away the bonuses from people guilty of causing harm (the Ob', Severyanka, Sibselmash and Elektrosignal production associations). It is understandable that in the majority of cases the guilty party cannot make reimbursement for all the damage. In this connection a suggestion has been made to make reimbursement from the wages of the party

guilty of causing damage to the enterprise in an amount of one-third of his average monthly earnings and to change to more and more complete compensation for losses, charging the guilty party for them. This presupposes an essential change in the legal norms. There is still work to do in this area for both science and practice.

A suggestion was made at the conference concerning the formation of a special fund for providing for stable work of contract collectives. Some people think that for its sources one could use money expended on payment for overtime work and also money paid from the material incentive under the item "one-time incentives for individual workers for the performance of especially important production assignments." This fund could also include money spent on bonuses according to indicators of rhythmic work, the completeness of stocks, the fulfillment of the plan for the basic products list, and also money released as a result of reducing wages for people guilty of causing damage. The money from this fund could be used for incentives for contract collectives for rhythmic, continuous work and high product quality and to compensate for additional expenditures of labor on the part of individual workers and contract collectives in order to make up for breaks in the technological chain.

Consequently, the better the collective works, the less the compensation paid from the fund and the more money there is left for incentives for continuous work. Thus a considerable part of the wage fund begins to perform a more active role in ensuring rhythmic production and improved quality of the products that are produced. Also, as the director of the Scientific Research Institute of Labor, Dr of Economic Sciences Ye. G. Antosenkov admitted in his speech, so far the system of the economic mechanism is "not closed" on the consumer or in the contract collectives. "We have not solved the problem of quality," he said, "the 'test' for product quality should be stricter." Both scientists and practical workers have work to do in this area.

The introduction of state receiving will undoubtedly help improve this situation. But it is necessary to improve economic methods for product quality control. Indicators of quality should be reflected in the conditions of agreements concluded between contract collectives and the administration.

"A large proportion of contract collectives," noted Academician A. G. Aganbegyan in his speech, "are given incentives now for increased labor productivity. This tradition comes from the Shchekino Experiment. No other experiment, including the large-scale one, is producing such a growth rate of labor productivity." A. G. Aganbegyan suggests "borrowing" a whole number of indicators of production effectiveness. Take the reduction of the material-intensiveness of items. Incentives for economizing on raw and processed materials comprise a miserly amount, including in contract collectives. The introduction of cost accounting should envision accounting for materials. Consequently there will be a basis not only for increasing labor productivity, but also for reducing the material-intensiveness of the products. This will deepen the collective contract. It is precisely along the path of its deepening and not on the basis of a formal increase in the number of contract collectives that the progress should be made.

The contracts will go even deeper if one adds to the two aforementioned components a third: accounting, control and incentive for the utilization of equipment. In agriculture, in Stavropol, for example, as A. G. Aganbegyan noted, contract collectives refuse surplus equipment. But this area too is in a rudimentary condition. So far for the national economy it is more typical to have a situation analogous to the one that arose in automotive transportation where the automobiles are becoming more and more expensive, but they are operating 9 hours out of 24. Moreover half of them are not loaded when they are running, and the other half is loaded only by 70 percent. They stand idle for 3 hours and more while being unloaded. Therefore organizational-economic resources become very significant in this stage. A deepening of the collective contract will contribute to a significant improvement in their utilization.

As was noted in the speeches of the economists of the Siberian branch of VASKhNIL who are participating in the introduction of the contract on the Morskoy Sovkhoz, the positive results could be significantly greater were it not for shortcomings in the system of planning and incentives. When conducting the experiment they did not manage to meet the most important initial organizational-economic condition for the effectiveness of the contract: establishing normative equally difficult planning assignments for the collectives and introducing the corresponding evaluation of their work that reflects a change in the objective conditions of production and determines the level of material and moral reward for the collectives. The application of the outdated principle of planning "from what has been achieved" does not give the collectives confidence in the social justice of the evaluation of their labor and does not contribute to accelerated introduction of the achievements of scientific and technical progress and advanced practice or the disclosure and utilization of internal reserves.

It will probably be necessary to restructure the system of intraproduction management, to bring the "vertical" and "horizontal" interconnections in the enterprise in line with the requirements of the collective contract, having placed the contract collective in the center of intraplant planning, and to make this the basic objective of management. In turn, in the opinion of participants in the conference, the final product of the collective (item, component, object of construction and so forth) should be the basic planning-accounting, normative and payment unit.

One of the central questions in further development of contract methods of management is the question of the agreement of the contract. Historically the conditions for material incentives and responsibility for the results of the work have been regulated under the conditions of contract methods of management by means of concluding an agreement between the client and the contractor for the performance of a particular assignment. It now determines the conditions for the performance of work, the rights of the labor collectives in the area of the organization of labor and production, the amount of the collective remuneration, and also the obligations of the labor collective (for performing the production assignment, efficiently utilizing the socialist property entrusted to it) and the administration (for ensuring continuous work of the collective), and the policy is established for applying sanctions for failure to observe the agreement.

Is the agreement a mandatory part of the contract? There are various opinions regarding this among scientific workers as well as practical workers. Some think that it is not simply an element of the contract but its most important distinguishing features, while others deny that it must be concluded. What is the essence of the agreement? Here is what Yu. P. Batalin said about this:

"The agreement is an economic-legal form of relations of material interest and responsibility of the parties. It guarantees the labor collective its rights, it strictly regulates obligations, and it is a powerful organizing factor. But, in our opinion, in places where they have reached a high level of organization of labor and production the functions of the contract can be performed by an intraproduction system of planning, accounting, evaluation, material stimulation and responsibility. Here it is expedient to periodically revise and reassert the plant provisions concerning the collective contract and where to determine the basic principles and forms of application of contract principles with respect to the specific features of a concrete production and its individual subdivisions, establish the rights and responsibilities of the contract collectives and the administration, the functional services, the competence of the councils of contract collectives, and so forth. This should take place at meetings or in conferences of labor collectives.

"As concerns the agreement, it is especially necessary to conclude this in the initial stage of the introduction of contract methods of management at enterprises with a low organizational and technical level. This will provide for psychological confidence on the part of the collectives in the observance of contract principles of work and will increase the responsibility of the administration for strict fulfillment of the commitments it takes on."

The Social Effect of the Contract

To a large degree, increasing the effectiveness of the work of large contract collectives is linked to the utilization of the engineering potential and the engineering preparation and work of engineering and technical personnel for the future. Associates of the Novosibirsk Institute of the National Economy who spoke at the conference noted that the main functions of the foreman are still the organization of labor and production in the section, preparation of production, and control of technological and labor discipline, product quality, and educational work. But the center of gravity of his work has shifted from solving operational current problems to planned preparation of production activity of the section and comprehensive control over the course of production as well as its analysis. The analysis of the utilization of the work time of foremen conducted in contract shops of the Elektrosignal Plant showed that if before the foremen were included in the contract collective time expenditures on the performance of long-range jobs amounted to 33.5 percent of the working time, now they take up 45.2 percent of the time. For foremen of the sewing flow line No 11 of the Ob' Leather Footwear Association there has been a considerable increase in the amount of time spent on analyzing defective work in solving problems of improving product quality and at the same time expenditures of time on filling out orders and other current documentation have decreased by 26 percent.

The current work of the technologists has also changed. While previously the technologists limited their work simply to establishing violations of technological discipline, now the focus is placed on preventing them. They have become interested in increasing the qualifications of the workers. At the Elektrosignal Plant technologists are conducting schools of advanced practice at which workers are trained in advanced devices and methods of work. Here engineering and technical personnel in contract collectives prepare technological documentation and organizational work more rapidly than they did before. Engineering technologists have significantly reduced the amount of time for drawing up changes in technology, having taken over part of the work of the technological division.

The contract with its strict regulation of the rights and responsibilities of the parties can become a reliable guard against favoritism and administrative red tape as well as manifestations of bureaucratism. It places principally new and greater requirements on workers in the management sphere. This requires a considerable increase in their competence and professional level, and their development of skills for independent decision making that are based on a deep knowledge of production and a truly scientific analysis of the state of affairs that has arisen. "Under conditions of the contract the inability to figure out a situation or a negligent and careless attitude toward the matters entrusted to them and, as a result, mistakes in planning and administration must be severely punished through the ruble" said Yu. P. Batalin.

The discussion showed not only the importance of the collective contract, but also the fact that it has not had sufficient methodological development. "When we began the experiment," said Ye. G. Antosenkov, "we did not have a complete idea of how the contract collectives would fit into the economic mechanism. It is no accident that when moving from the level of the contract brigades to the level of shops and sections we encountered difficult problems which have already been discussed here. Probably if such a model existed it would be better to prepare for these problems."

Both scientists and practical workers see the basic value of the contract in the combination of measures for improving the economic mechanism from above and initiative from below. When introducing contract methods of management it is necessary to recall that any attempts to rush forward, as experience shows, are doomed to failure. But it is also inadmissible to be too slow in making transformations whose times are due. It is necessary to provide for stages in the extension of the collective contract to the larger organizational structures. The contract has proved its great effectiveness.

At the meeting of the aktiv of the Khabarovskiy Kray party organization, M. S. Gorbachev discussed the uniqueness of the current moment for the country's national economy: "We must learn on the run, solving new problems. And we must not be afraid to proceed boldly forward, to take risks and to take on responsibility. As they say, we shall carry out the restructuring on the march, during the course of the active solutions to economic and social problems."

What has been said pertains fully to the collective contract as well.

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INCENTIVES IN COLLECTIVE CONTRACT DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 68-78

[Article by V. S. Petukhov, candidate of economic sciences, division chief of the West Siberian branch of the Scientific Research Institute of Labor, and V. G. Shulzhenko, candidate of economic sciences, sector chief (Novosibirsk): "The Incentive Mechanism for the Contract Collective"]

[Text] In the Novosibirsk Experiment with the collective contract, they verified a principally new mechanism for material incentives for workers which is based on the collective normative-bonus system of wages which is the same for all categories of workers, including engineering and technical personnel. Payment, as a rule, is made in terms of the final product of the production cycle that is assigned to the collective (section, flow line, shift). The sum of earnings calculated according to the final result of the work of the collective includes wages as both of basic workers and of all the workers included in the contract collective. There is a guarantee of payment of all the calculated sum of wages, regardless of the number of workers it takes to carry out this volume of work. Because of this the collective is motivated to reduce labor expenditures and work with fewer people.

The Formation of Collective Wages

The collective wage fund (Fw) is formed from two parts: by multiplying the normative of expenditures on wages per unit of output (N) by the volume of actual products produced) (Of) and bonuses (P) obtained according to the results of the activity. Thus,

$$Fw = Of \times N + P.$$

How is the normative of wage expenditures per unit of output calculated? It is determined by dividing the planned fund of basic wages of the section (Fp) by the planned volume of work of the section in the adopted units (Op) whether this be the number of pair of shoes planned, sewn items or instruments:

$$N = Fp/Op.$$

Let us give the example of the calculation of the normative of basic wages where the experimental section of the foreman N. I. Kornev in the framework-stamping shop of the Elektrosignal Plant.

| | |
|--|--------------------|
| Annual volume of production | 122,300 norm-hours |
| Piece-rate wage fund | 74,892 rubles |
| Wage fund for service personnel | 11,040 rubles |
| Salaries for engineering and technical personnel | 6,900 rubles |
| Assignment for reducing labor-intensiveness | |
| Technological | 3% |
| In servicing production | 3% |

$$N = \frac{74,892 \times (100-3) + 11,040 \times (100-3) + 6,900}{122,300} = 0.74 \text{ rubles}$$

It should be noted that the normative does not include all wages but only those elements that depend immediately on the results of the labor of the section's collective. Herein lies the main distinction of the normative tested in the Novosibirsk Experiment as compared to the one that is applied at the level of enterprises in the large-scale experiment and under the new conditions of management.

Previously only the earnings of the basic piece-rate workers were linked directly, through the piece-rate wages, to the output of each unit of product. In certain cases for auxiliary workers an indirect piece-rate wage was applied for the output of products. Most frequently both the auxiliary workers and the engineering and technical personnel were given incentives for the volume of products produced through the bonus. This, however, was not linked to any unit of output, but to a level equal to the planned volume or higher. And wage rates and salaries did not depend on the volume of products manufactured.

When calculating the wage fund under the conditions of the Novosibirsk Experiment, all workers of the contract collective, including auxiliary workers and engineering and technical personnel, are motivated to increase the output of products. The more products that are manufactured the higher the sum of the collective earnings.

Various methods were used to calculate the planned wage fund (Fp) at Novosibirsk enterprises that were participating in the experiment. According to one of these the calculation was done on the basis of the average wage level that had been reached and its further increase in keeping with the planned ratio between the growth of labor productivity and wages. The difficulty of applying this method consists in that one cannot use the same value of the ratio for all sections. This is because the organizational and technical measures conducted at the enterprise are not distributed uniformly among the sections, either in terms of quantity or in terms of effectiveness. Therefore each section must have an individual ratio planned for it, which in itself is an extremely difficult thing.

According to the second method Fp was calculated in terms of the base labor productivity and was reduced as labor-intensiveness decreased, which

essentially concretizes the assignment for increasing labor productivity for the given collective of the section.

In the recommendations of the Scientific Research Institute of Labor (Footnote 1) it is suggested that when calculating the wage normative, at the same time one takes into account the assignment for reducing labor-intensiveness and the quality of the norms that are being applied. The interconnection between these two indicators is obvious: the more difficult the norms that are used in a given section, the less the reserves for reducing them and the smaller the assignment for reducing them and, conversely, for those sections where less difficult norms are in effect the administration has the right to establish larger assignments for reducing labor-intensiveness.

Thus in the framework-stamping shop of the Elektrosignal Plant, whose sections were the first (in 1971) to introduce the collective contract, in 1986 they established a reduction of labor-intensiveness of 3 percent. In this shop during the 15 years under the collective contract organizational resources have been exhausted. Without technical reequipment it is impossible to significantly reduce labor-intensiveness here. There are much greater reserves in the galvanizing shop, which changed over to the contract method after technical reequipment. Therefore the assignment for reducing labor-intensiveness for 1986 was set at 12 percent for it. There is quite obviously a need to accelerate the reequipment of the framework-stamping shop.

When calculating the stable normative one takes into account the fact that during the course of the year organizational and technical measures have been conducted which increase labor productivity, and the normative is decreased in keeping with the planned reduction of labor-intensiveness. The problem is that the normative begins to go into effect from the beginning of the planned year but the measures are conducted throughout the course of the entire year. Therefore at the beginning of the year there is an underpayment of the relative wages and by the end of the year, an overpayment.

Although on the whole for the year the sections reached the planned sum of wages, today this is sometimes regarded as a shortcoming. In order to avoid it, certain enterprises revised the normative throughout the course of the year as measures are introduced. But this complicates the utilization of the normative and important advantages of it are lost. For with a stable normative, the sooner a measure is conducted the more time the collective will have to take advantage of the effect from its introduction. And, conversely, if a measure is conducted later than was intended, the collective will receive less wages than they should for the actual amount of labor that was expended. Thus the effect of a stable long-term normative creates incentive for the collective to introduce organizational and technical measures promptly and even ahead of time, and the principle of stability should not be violated.

We should like to draw attention to this aspect. The previously existing mechanism for payment provided, as a rule, for proportional changes in the wage fund for the first group of workers and stability for the second group (auxiliary workers and engineering and technical personnel). But the application of the wage normative per unit of output requires a change in the wage fund of both the first and second groups of workers in proportion to the

change in the volume of products produced. Thus a "scissors" is formed between the wage fund calculated according to the conditions of the enterprise and the fund calculated according to the conditions of the contract.

Analysis shows that overall for the year the difference between the wage fund calculated according to the normative and the wage fund formed according to the usual policy depends on the following factors:

- a) the number of time-rate workers employed in management and servicing of production and their share of the wages in the normative wage fund;
- b) the overfulfillment (underfulfillment) of the planned volume of work.

At Assembly Section No 3 of the Elektrosignal Plant the 1985 plan for the volume of production was overfulfilled by 2.3 percent, and the proportion of wages of auxiliary workers and engineering and technical personnel in the normative was 0.137. Thus the deviation from the wage fund calculated according to the usual policy was $2.3 \times 0.137 = 0.3$ percent. Is it always expedient to allow even such a small increase in the wage fund? Apparently not always. It is advantageous in both cases when the industry needs to stimulate an increase in the output of products. If the products produced by a participant in the experiment, the shop for pressure instruments of the Novosibirsk Instrument Plant, have a practically unlimited demand today, the Inskaya Railroad Station might process only the number of cars that come to the station. Or a bread combine must bake exactly as much bread as the population will purchase on that day. And the need for bread fluctuates from month to month and among the days of the week and therefore the volume of bread that is baked fluctuates and depends only on the limited demand of the day and not on the capabilities of the collective of the bread combine to increase the production volume (before holidays and during summer vacation the production volume decreases). So is there really a need for us to provide additional incentive to achieve something we do not need? Obviously not.

In those cases in which there is no need to increase output, and also when there are significant fluctuations in the planned output among the various months, especially if the number of workers employed in service and management of production in the collective is not great, in order to eliminate an unjustified fluctuation of the normative wage fund it is suggested that it be formed from two parts. One part is formed according to the normative wage per unit of volume of output calculated according to piece rates and the other is established in the form of a normative (stable) sum calculated on the basis of wage rates and salaries of time rate workers and engineering and technical personnel. Thus one can provide for a change in the wage fund that is proportional to the volume of production and is calculated according to the technological labor-intensiveness, as well as relative stability of the wage fund for service and management of production and also coordination of the principles for formation of the wage fund at the level of the enterprise and its contract collectives.

We should like to discuss one more problem. The provisions concerning conducting the experiment envisioned that the minimum wage for a member of the collective could not be less than the amount established by the wage rate or

the salary for the time worked with the exception of cases indicated in labor legislation (failure to fulfill output norms, defective work or idle time caused by the workers). But when the plan is not fulfilled by the contract section, there arises a situation in which the wages calculated according to the normative are not enough to pay the wage rates and salaries.

At some enterprises (for example, in the sewing shop of the Severyanka Sewing Association) the additional payments for groups of time-rate workers (mechanics, workers of the division for technical control, general shop engineering and technical personnel) are made according to savings obtained from workers who do not show up for work, particularly from their bonuses. Therefore the money calculated according to the normative is not enough when the plan is not fulfilled.

It seems to us that it is still necessary to approve in cases of failure to fulfill the plan a reduction of wages below the wage rate and salaries, even though the State Committee for Labor and Social Problems does not permit this yet. This reduction, of course, must be made only when the failure to fulfill the assignments is the fault of the collective. If this has been caused by factors that do not depend on the collective--interruptions in supply, in the output of electric energy, unforeseen breakdowns of equipment--then, in keeping with the contract agreement, the enterprise must compensate for losses in the wages of the section at the expense of the guilty parties.

Formation of the Bonus Fund

The bonus holds an important place in the mechanism for incentives. In provisions concerning bonuses for workers of associations and enterprises, they usually separate the indicators for bonuses of workers and of engineering and technical personnel. With the forms of labor organization that are in effect, it could be no other way. But contract collectives are responsible for the overall final result. Additionally, they combine various categories of workers who were previously given bonuses from various sources according to indicators that were not coordinated and in various amounts. How should incentives be provided now?

Initially in a number of contract collectives the bonuses were paid for individual occupations and categories of workers included in the collective. This approach did not contribute to the community of interests of the collective and did not make it possible to regard it as a single production unit and arrange economic relations with it as with a relatively separate unit. Therefore during the course of the experiment there was a changeover from awarding bonuses according to indicators that reflect the results of the labor of individual members of the collective (the fulfillment of output norms, normed assignments and so forth) to indicators that reflect the results of the labor of the entire structural subdivision. A greater dependency was established between the individual earnings and the collective results. At the majority of enterprises the formation of the bonus fund for contract collectives of sections came to be done according to general final indicators and in a general amount. And it was distributed according to individual coefficients of labor participation (KTU) for each worker.

Such changes in the incentive mechanism contributed to uniting the interests of all workers of the contract collective and directing them toward the solutions to common tasks. But there are bonuses, for example, for the introduction of new technical equipment, which are calculated personally for each worker participating in the measure. A certain amount of friction arises in the collective among those who can receive a bonus only for the fulfillment of planned assignments and those who can additionally receive bonuses for the introduction of new technical equipment. It would probably be more correct to pay this kind of bonus to the collective and not to the individual member. Additionally, one of the indicators of the KTU should be the "participation in the introduction of new technical equipment and technology." Then the council of the collective could increase the KTU for those who directly master new technical equipment technology. At the same time it has the right to distribute part of the bonus among other members of the collective since they have had to exert more effort in order to fulfill the planned assignments.

The Distribution Mechanism

A most important question in wages for contract collectives is how to distribute the collective earnings among its members so as to provide for a correct combination of collective and individual material motivation to achieve high final results.

The formation of the collective wage fund according to the general final results establishes certain limits within whose framework it is expedient for each member of the collective to increase his labor contribution. And the distribution is carried out in the form of the mechanism for providing incentive for individual results of labor.

What all contract collectives had in common was the fact that at the level of the section the distribution of wages was done using the KTU. But then some collectives distributed all the earnings in excess of the wage rate according to the KTU while others distributed the savings on wages and bonuses this way, while still others distributed only the savings on the wage fund or only the bonus this way. The rest of the earnings were distributed according to the wage rates and salaries or according to individual output.

Methods of distribution determine the possibility of realizing personal interests. In the contract collective the interests of the workers and of the engineering and technical personnel in fulfilling the plan coincide because all members of the collective receive a bonus for this. But in the overfulfillment of the plan the interests of the workers and those of the engineering and technical personnel shift somewhat. What do the workers receive when the plan is overfulfilled? The possibility of earning more. But the workers can also earn more by fulfilling the assignment with fewer personnel. Engineering and technical personnel are more interested than the workers are in overfulfilling the plan because this leads to the creation of "piece-rate increments" to their salaries. But on the whole the collective is interested in working with fewer personnel since it is guaranteed payment of the entire sum of the wages calculated for the fulfillment of the volume of work, regardless of the number of personnel with which this volume is fulfilled, and the bonus is calculated for the increase in labor productivity.

The mechanism for the distribution of wages in the Novosibirsk Experiment contributes to the mastery of associated occupations. With the previously stipulated conditions for production the increased output by the basic workers (only in their own operations) was extremely limited. Now it could be achieved as a result of performing work in related operations. Therefore these have been mastered everywhere. The proportion of workers who combine occupations at enterprises participating in the experiment increased by 54 percent in 1984 as compared to the base year of 1983, and by 80 percent in 1985. The combining of occupations and operations was most well-developed in collectives of the Severyanka Production Association, the instrument plant and the Ob' Leather Footwear Association.

The main direction in reducing the number of personnel in the contract collective has been reducing the number of service workers. This category of workers is most interested in reducing the number of personnel because a large part of the savings on the wage fund obtained this way is paid to them. Even in the first year of the work of the Novosibirsk collectives under the conditions of the contract, the number of workers taking responsibility for partial or complete performance of service functions increased by 44 percent and those who expanded the zones of their work and increased their work volumes more than doubled.

As a rule there are no reductions of the number of engineering and technical personnel in the sections since their number is insignificant in the first place. But the temporary absence of one engineer or another does not cause problems because the collective council establishes additional payment or increases the KTU for the person who replaces him.

Although the interests of various categories of workers who have been included in the collective still do not coincide fully, the results of 2 years of the application of this incentive mechanism shows that it makes it possible to achieve a considerable acceleration in the growth rates of the volumes of production and labor productivity. Especially high indicators were achieved by collectives of sections. While in 1984 12 experimental collectives increased the volume of output of products by 10 percent and more, and two collectives increased them by more than 30 percent, in 1985 18 collectives achieved this same indicator including five collectives which achieved more than 30 percent.

From the results of the experiment one can draw the conclusion that the system of incentives tested during the course of it is suitable for extensive application in contract sections. It has been included in the published "Methodological Recommendations for the Application of the Collective Contract in Production Sections." Additionally, the experiments show that the mechanism for material incentives for the collective contract is in need of further improvement.

Problems and Prospects

One of the significant shortcomings in the incentive system is the fact that it does not motivate people to introduce new equipment and principally new

technologies or to mechanize and automate production, since all of the labor-intensiveness that is saved as a result of these measures is now removed from the collective. This most important part of the development and improvement of production still falls outside the mechanism of economic influence on members of the collective, section, shop and, above all, the engineering and technical personnel.

In the experiment they used methods of forming the collective wage fund and the wage normative irrespective of the organizational structure of the contract collectives. This included the collective of a production section where there was one foreman and one work distributor, and the rest were piece-rate workers and auxiliary workers; and a collective of affection (for example, for the assimilation of new models of footwear at the Ob' Production Association) where one-third of the collective are engineering and technical personnel; and the collective of a shop of 500 people whose individual sections are technologically independent; and the collective of the Inskaya Railroad Station where about 40 percent of the workers are engineering and technical personnel.

Extensive development of the economic contract requires the development of new means of the normative method for forming wages taking into account the specific features of the production conditions. It is necessary to establish a closer dependency between the amount of collective earnings and the indicators that characterize the basic directions for the intensification of production: acceleration of the development and the assimilation of new technical equipment, technology, and products; effective utilization of work time, equipment, raw and processed materials; and improvement of product quality. The lack of development of the mechanism for incentives for economizing on material resources depends both on the fact that cost accounting is being introduced poorly and on the imperfection of methods of calculation and control of expenditures on production. Accounting and control of thermal energy bearers, for example, cannot be organized at the level of sections anywhere because of the lack of control and measurement instruments, which are installed only in the shop and even in a couple of shops that are located in the same building. Shortcomings in incentives for economizing on material expenditures will be eliminated when the collective contract is extended to higher levels.

The changeover that has been started to a new level of the experiment--to contract shops and enterprises as a whole--has shown that it is necessary to solve a number of other problems. One of the important ones is how to form the collective wage fund? On the whole for the shop or is it sufficient to form it for individual structural subdivisions? How should it be distributed? The collective earnings have not been distributed at once among individual workers at any one of the shops that have been included in the experiment. Initially they were distributed among structural subdivisions according to section normatives, and then among members of these collectives. The Elektrosignal Plant in conjunction with our institute has developed a method of distribution of collective earnings among participants according to the coefficient of labor contribution (KTV) of the subdivisions. But it has not actually been applied since the shop collectives are not psychologically ready to take such a step in the development of the experiment.

It is still being suggested that they try this variant--distribution of the overall earnings of the shop among structural subdivisions according to the coefficient of the labor contribution (section, shift, flow line)--of the KTV, but the collective distributes among the members of the collective as it does now, on the basis of individual coefficients of labor participation (KTU). A second variant is also being considered: distribution according to section normatives of wages and volumes of work performed, and then according to the KTU among members of the collective. So far the enterprises are giving preference to the latter variant.

Apparently the unified shop wage fund for collective labor will be better formed in those shops which immediately change over completely to the conditions of the collective contract. It is precisely in this direction that the experiment is now continuing, especially in small shops.

With the development of the shop contract, it seems expedient to test experimentally the creation of the unified fund for incentives on a normative basis as well. That is instead of awarding bonuses from the wage fund and the material incentive fund, a unified source of bonuses should be created. And when the bonuses are distributed the indicators of bonuses and the labor contribution should be taken into account.

FOOTNOTE

1. "Normative Planning of the Wage Fund of the Production Association (Enterprise). Methodological Recommendations," Moscow, Scientific Research Institute of Labor, 1984.

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NOVOSIBIRSK COLLECTIVE CONTRACT EXPERIMENT EVALUATED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 79-88

[Article by A. P. Filatov, first secretary of the Novosibirsk CPSU Obkom: "The Collective Contract in Novosibirsk Oblast: Results and Prospects"]

[Text] In his speech at the 27th CPSU Congress, general secretary of the CPSU Central Committee M. S. Gorbachev notes that a relatively rapid return can be achieved if organizational-economic and social reserves are put to work, and above all, if the human factor is activated and we reach a point where everyone works in his job conscientiously and with all his energy. These requirements are met most completely by the collective methods of labor organization that have become widespread in our country. In industry and agriculture in our oblast almost two-thirds of the workers are working in brigades. In agriculture about 40 percent of the subdivisions are working under a contract. In places where the brigades have not been created formulaically, and where cost-accounting principles are utilized the workers participate actively in the management of production, true collectivism is formed, and social activity increases.

But we know that the brigades have produced less than was expected of them. One of the most important reasons is that their organization has proceeded without a qualitatively restructuring of the economic mechanism within the enterprises. Specialists and middle-level managers do not have a strong economic interest in the final results of the work of the brigade. Including engineering and technical personnel in the brigades helps to rectify this shortcoming. But even under this condition the level of the brigade is still not sufficiently high for more complete unification of individual and public interests.

The advantages of the collective form of labor organization are manifested more completely if its principles are extended to higher levels than the brigade, as was done at the Elektrosignal Plant as early as 15 years ago. Here the contract form of organization and stimulation of labor was applied for the sections. Taking into account the results achieved at Elektrosignal, it was decided to conduct an experimental verification of the effectiveness of the collective contract in sections, shops and shifts of other enterprises and organizations of Novosibirsk and the oblast.

The provisions concerning the experiment envision the creation of organizational and economic conditions which include radical transformations in the main sphere of the life activity of people--labor. Radical changes were made in more than 20 of the existing provisions and instructions concerning organization and payment for labor, cost accounting, management and especially self-management: in the area of rights and responsibilities, evaluation of labor activity and interrelations among members of the collective, associated subdivisions and management units. Thus piece rates, wage rates and salaries did not sufficiently account for the individual contribution of each individual to the final collective results. In the contract these have been replaced with stable long-term normatives. Wages are distributed according to the KTU [coefficient of labor participation]. The labor norms now serve to determine the labor contribution of each worker to the results of the work of the collective.

The transformations made in the organization of labor are significant. For engineering personnel the center of gravity of their work has shifted from eliminating various kinds of interruptions in production to planned preparation of the production activity of their subdivisions. For technologists it has shifted to more careful preparation of production. It is precisely according to these indicators that the labor activity of engineering and technical personnel is now evaluated.

The councils of contracting collectives have been transformed from consulting agencies under the administration into agencies that make decisions and interact with the administration on all issues. Whereas before the initiative for concluding agreements always came from the administration, now it comes from the contract collectives. One can judge the force of this initiative if only from the fact that at the Elektrosignal Plant certain collectives did not conclude agreements with the administration until May. Of course such tardiness in and of itself is a negative fact if one considers that the agreement is one of the most important conditions of the experiment. But this also shows the power of the contract collective: the interested attitude toward the matter on the part of specialists and workers made it possible to provide a well-substantiated formulation of requirements for the organization of production, labor and management for which the administration of the enterprise was initially not quite prepared. The value of the collective contract consists in that it is comprehensible to the workers and leads the collective directly to generally significant goals. Contract collectives take on a full share of control over the realization of the most important principle of socialism--to each according to the results of his labor.

Another aspect of the Novosibirsk method is also of considerable importance. A large-scale economic experiment has taken place in the country and the absolute majority of enterprises have changed over to new conditions of management. But the problems associated with this changeover most often become the subject of concern and alarm on the part of the management staffs of the enterprises. Our experiment runs counter to the new methods of management from below, from the direct workers, where everyone, because of the established conditions, manifests equally both personal interest and personal responsibility.

On the basis of the Novosibirsk experiment the USSR State Committee for Labor and Social Problems and the AUCCTU made a decision for mass dissemination of the collective contract in the country of the level of sections and the continuation in our oblast of the experiment in developing contract methods at the level of shops and other large structural subdivisions. A decision was also made to conduct an experiment in 1986-1988 for regulating on the basis of contract principles the recruitment of workers of enterprises for raising and harvesting potatoes and vegetables in the suburban zone. The corresponding standard provisions were approved. But does this mean that all problems have been solved? No, we can speak only about preliminary results of the search for effective methods of management, both intraproduction and territorial.

But what are the results of the experiment? The application of the collective contract in the sections, shops and structural subdivisions has shown its fairly high socioeconomic effectiveness. The growth rates of the volume of production and labor productivity in contract collectives of sections are generally higher by a factor of 2-2.5 compared to the enterprises as a whole. In 2 years the growth of the production volume of contract sections amounted to an average of 118.5 percent, labor productivity--124.2 percent, and average wages--106.9 percent. In contract collectives one sees true collectivism, mutual demandingness, comradely mutual assistance, responsibility increases and so does the interest in the final results of the labor. All this has a positive effect on the reduction of labor turnover and the strengthening of labor and production discipline. Thus losses of working time because of violations of labor discipline have decreased in collectives operating under conditions of the contract by 25-30 percent and amounted to 0.34 man-days per one worker as compared to 1.41 man-days in the oblast's industry as a whole.

The collective contract makes it possible to significantly improve product quality. At the Elektrosignal Plant they had practically eliminated the previously widespread returns of parts from associated workers to the stamping and galvanizing shop, which are working under a contract. The number of complaints about the work of the Khimchistka Factory have decreased by almost half. The Morskoy Sovkhoz has received 30,000 rubles in additional payments for improving the quality of milk. Good results in improving product quality have been achieved in other contract collectives as well. This has taken place primarily as a result of including principles of material responsibility of contract collectives for product quality and increasing mutual demandingness within the subdivisions and with respect to associated workers as well as increasing the role of specialists.

Under the conditions of the contract there was a marked increase in the effectiveness of the labor of engineering and technical personnel and their interest in the final results of the labor of the collective. In the Ob' Association, for example, as a result of progressive engineering solutions, the time period for assimilating new products was reduced to one-third the previous amount. Another thing is also typical: at the beginning of the experiment engineering and technical personnel spent up to 30 percent of their time on work caused by interruptions in production. At the present time, because of the improvement in the organization of production, these time expenditures have been reduced.

The collective contract makes it possible to ease the problem of the personnel shortage. With a significant increase in the volumes of production, the number of workers in contract collectives has decreased by 5 percent, and 7.5 percent of the engineering and technical personnel have been released. According to calculations of specialists, extending the experiment to the scale of the oblast would reduce by half the shortage of labor resources expected during the next five-year plan.

Of course we did not manage to solve all problems during the course of the experiment. The party obkom had a meeting with brigade leaders, foremen, and chiefs of sections and shops who are participating in the experiment. It was precisely here that we could see clearly how far we are from exhausting the problems set by the experiment and how many unexpected occurrences there still are both of a purely economic nature and in solving administrative problems and in achieving educational goals. One must say directly that not everything turned out as it was intended, and not everything was done correctly. In a number of subdivisions, especially at the level of the shops, mistakes were made in the development of provisions concerning the contract and long-term normatives, and certain workers, specialists and managers did not understand and did not accept the contract. A negative role was also played by shortcomings in the material and technical supply for production. All this led to a situation where almost one-fourth of the experimental collectives failed to fulfill the tasks set for them. The difficulties in providing raw materials, processed materials and batching items are being experienced by shops and sections of the rural construction combine, the instrument plant, the Severyanka and Sorevnovaniye Sewing Associations, and so forth.

But planning is still a complicated problem under the conditions of the contract. The contract can survive only under the condition that the collectives are provided with difficult but realistic planning assignments. Things must be arranged so that the subdivision can discuss them thoroughly and promptly, calculate its capabilities, and acquire confidence in the fulfillment of the plan, and then include all this in the agreement. Planning "from the level achieved" places collectives that are working well in disadvantageous economic conditions. We are speaking about the fact that labor collectives are not given equally difficult production plans that are balanced in terms of resources. There is no objective evaluation of the results of their work taking into account the actual conditions for production.

Here are a couple of examples. The Zavodskoy and Yarkovskiy sovkhoses, which are using the newly constructed Cheminskaya irrigation system, for each hectare of irrigated land in 1985 had a plan for sales of vegetables and potatoes that was less by a factor of 2 and 3.5, respectively, than that of the Morskoy Sovkhoz that was working under the conditions of the collective contract and had the old irrigation system, and only on the basis of this its plan was based on the level reached in the preceding year. The assignment for 1986 was reduced for the Zavodskoy Sovkhoz, which did not fulfill the 1985 plan, but it was increased for the Yarkovskiy, which fulfilled the plan. The assignment was also increased for the Morskoy, where the production conditions are deteriorating because of the aging of the irrigation system.

Shop No 10 of the Novosibirsk Instrument Plant, which has been working under conditions of the contract, in 1986 increased the volume of products produced by 25 percent and the normative net output by 1 million rubles. This was practically the plan's entire increase for 1986. The problem is that the shop produces 90 percent of the overall volume of three-jawed boring chucks for machine tools with numerical program control that are manufactured in the country. And the Ministry of the Machine Tool and Tool-Building Industry has set for the plant and the plant has set for the shop this plan that is based on the national economic need. The shop's collective signed a contract agreement which clearly stipulated the possibility and the conditions for carrying out this assignment. Uniform supply of metal of all profiles, the expansion of one of the sections, and a certain increase in the number of personnel (7 percent; all the rest of the increase in volumes was to have been achieved as a result of increasing labor productivity. The conditions of the contract agreement could not be met. There were constant interruptions in the delivery of metal, the expansion of the section was proceeding slowly, and not all the necessary equipment had been installed. As a result, although the shop achieved an increase in labor productivity of 15 percent, on the whole for the plant it was half this much and the shop could not fulfill the production assignment so it ended up without a bonus. This is a clear discreditation of the experiment with the collective contract.

The creation of a normative-economic mechanism for management of the contract collectives is a matter of great state importance, since only this way is it possible to provide for increasing the motivation of the workers and to achieve an increase in responsibility and initiative.

We have not completely solved all problems with introducing complete cost accounting. Without cost accounting the collective contract practically loses its meaning. But today the experimental subdivisions, because of the lack of the appropriate normative base, instruments and means of control, and sometimes simply mismanagement, are not given the full planned volumes for the expenditure of energy, raw materials and processed materials, and the proper accounting is certainly not provided everywhere. We have not achieved everywhere the introduction of a system of cost accounting complaints, checks for reciprocal accounts, or collective and personal accounts of savings.

It is necessary to improve the mechanism for the distribution of wages according to the coefficient of labor participation. As we know, with this form the labor contribution of the workers is taken into account more fully and the payment for their labor is more just. Thus the principle of distribution is correct but the mechanism--the coefficient of labor participation (KTU)--is imperfect. Today it is cumbersome and does not take into account the psychological factor. Excessive differentiation of indicators for the evaluation of the labor contribution when determining the KTU in a number of cases leads not to consolidation, but to dispersion of the collective, to triviality and sometimes even to narrow pedantry. When studying these questions there is still a good deal for both practical workers and scientific workers to do.

A most important issue that is being resolved during the course of the experiment is the attitude of contract collectives toward the achievements of science and technology. We have examples in which they literally chase after what is new and actively introduce advanced experience. But they are not always so interested in assimilating progressive technical equipment and technology, especially when this causes the normatives for wages to decrease. Since the contract collectives are working basically in a stable way and are successfully coping with their assignments, the engineering services of the enterprises and the managers are not in any hurry to carry out a radical technical reequipment of these sections since they know that the "bottlenecks" always demand more attention in production.

It has been noted that certain contract collectives are less active in the direction of streamlining and invention. The very nature of this activity has changed. This was discussed openly by the section chief of the Elektrosignal Plant, G. Shustov: "We are doing some things but we are not documenting them and not advertising them. If you submit an efficiency proposal they will change the technological process and the norms. The efficiency expert is permitted to work for 6 months according to the old norms, but he is the only one who can."

It turns out that "unofficially" the efficiency proposal is still introduced. But the innovation does not affect the entire enterprise or the national economy! Obviously the time has come for the State Committee for inventions and discoveries to revise the provisions concerning individual invention and efficiency proposals and coordinate them with the requirements and the specific features of collective forms of labor organization.

But the question of problems require a competent solution "from above" does not mean that in the local work places they can passively wait for clear-cut regulations concerning various questionable positions. The oblast party organization during this period persistently looked for new forms under the conditions of the contract. This is a difficult task. Specialists engage in improving organizational, methodological and legal foundations for the collective contract. How does one infringe upon their prerogatives without replacing their functions and becoming engaged in favoritism--this is not one of the easiest problems. Here one should rather speak of the ability to coordinate administrative, scientific, economic and social bases, control their work and, the main thing, suggest ways of overcoming the next problems that come up in practice.

The great scientific potential of Novosibirsk makes it possible to penetrate seriously and deeply into the problems of the contract. We have a right to expect of our scientists and specialists a closer link with the concrete problems. We keenly sense that there is not enough relative scientific analysis on the basis of which it is possible to develop recommendations: in what cases, why and where should the contract proceed well or move with difficulty. We must be able to predict such phenomena. For example, we have the educational influence of the collective that is joined together by the contract. A critical attitude on the part of four men, brigade leaders and workers toward themselves and toward one another stabilizes the atmosphere and creates a microclimate of a qualitatively different kind. And the forms and

methods of ideological education do not always correspond to this higher degree of development of the collective.

In management with the contract party and trade union organizations of the enterprises should concentrate their efforts on stepping up the activity of councils of contract collectives. The development of the contract and increased effectiveness of its application are related precisely to their work. The councils provide for fulfillment of contractual agreements, participate in the distribution of the collective earnings, resolve intraproduction problems, and represent the collective before the administration. The improvement of well-being can be presented in quantitative evaluations, but the sociopsychological effect cannot be represented in figures. We must be concerned that the regulation of the attitudes in collective labor is not measured by the ruble alone.

When we emphasize as especially important achievements of the contract the increased solidarity, improvement of the professional-skill structure, and reduction of labor turnover in contract collectives, it is necessary to foresee also a possible leaning away from its basic goal. Do not extraclass workers and youth going into the profession and up at diametrically opposed points? This problem, unfortunately, was not thought of beforehand. When creating the collective contract this is one of the difficulties: workers with high qualifications at first do not wish to join with the "average workers" and "green youth." It is difficult to restructure the ingrained psychology and the habit of living and working according to the old standards. Here it is necessary to work more attentively with such a fine instrument as the human factor.

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USE OF ROBOTS IN INDUSTRY DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 88-103

[Article by L. I. Volchkevich, doctor of technical sciences, professor, department chief of the MVTU imeni N. E. Bauman, chairman of the Committee for Automation and Mechanization of the VSNT O (Moscow): "There Are Robots and Then There are Robots"; first two paragraphs EKO introduction]

[Text] Five years have passed since publication of our article entitled "Robots--the Reality of the 20th Century" (EKO, No 2, 1982). Under the 12th Five-Year Plan, as was noted at the 27th CPSU Congress, robots, rotary conveyor lines and flexible automated productions are becoming a typical feature of automation. The output of robots under the 11th Five-Year Plan increased by a factor of almost 8.5 as compared to the 10th, and it should almost double again by 1990 as compared to 1985. At the same time serious mistakes have been revealed in the development of robot equipment and in the robotization of production, as a result of which they are not producing the effect it should be possible to count on. It is necessary to interpret the path that has been traveled realistically, and to take serious measures to increase the effectiveness of the robotization of production.

The materials in this selection are on problems of robotization.

Industrial robots (PR) managed happily to avoid the period of mistrust and underestimation. On the contrary, not a single technical means was given such enraptured praise in advance, and not a single one was given so much attention. In our country in short periods of time we created a network of specialized enterprises and organizations for robot construction in many machine-building and instrument-building ministries. While during the 10th Five-Year Plan about 6,000 robots were produced, during the 11th Five-Year Plan it was almost 50,000, and under the 12th Five-Year Plan it is intended to produce about 100,000 robots.

It would seem that the combination of the undoubted progressiveness and the increased attention should have provided for triumphant progress of industrial robots and their weighty contribution to solving problems of intensification of production. But this has not happened yet. During the first half of the 11th Five-Year Plan (1981-1983), according to official figures, 26,000

industrial robots have been produced, but only 13,000 have been introduced, that is, no more than half. They have said that the delay with the introduction took place because of difficulties in delivery and installation, and that the work will be accelerated in the future. But the figures for the first half of 1984 have been even more depressing--no more than a third of the industrial robots that have been produced have been introduced. So what is happening?

Let us turn to the results of an analysis conducted at a number of enterprises. (Footnote 1) Here 600 industrial robots released 85 workers, in other words, an average of seven robots that were introduced released a total of one worker. Such are the social results.

The cost of the robots investigated here was about 10 million rubles. Consequently, the overall expenditures on robotization at the given enterprises amounted to approximately 30-35 million rubles, and the economic effect from their introduction...was 18,000 rubles. Such are the economic results.

At certain enterprises there are more optimistic results. But the final conclusions from this do not change. I daresay that robotization of production is experiencing serious difficulties which are reflected in the clear lack of correspondence between the expenditures of effort and money and their effective return.

In spite of the extreme situation, which is unprecedented in the history of domestic science and technology, the fanfare of "robot agitation" is as loud as before, but the system of planning and manufacturing of robot equipment is following along the same path. This means that one should not look for the causes in the mistakes or the subjectivity of individual specialists.

It is possible to understand and correctly evaluate what is happening today with the robotization of production only on the basis of an overall analysis of the negative processes in the development of our economy in recent years, which was done at the 27th Party Congress. It is emphasized in the decisions of the congress that a radical change in the rates of scientific and technical progress is inseparable from a restructuring of the economic mechanism and a radical change in the system of interrelations between the enterprises and the higher management organizations. It is unnatural to have a situation in which the amount of money allotted for construction, new technical equipment and so forth depends not so much on the final results of the activity of the enterprise as on the subjective, sometimes personal factors--the ability of the managers of the enterprises and associations to "scare up a maximum" of this money.

This pertains to an even greater degree of workers of ministry staffs for whom today the main guarantee of their well-being in their job is a reputation as indefatigable fighters for scientific and technical progress, ardent supporters of everything that is new, advanced and progressive. As a result the end is being substituted for the means. Scientific and technical progress is sometimes evaluated not according to the improvement of the most important technical and economic indicators of production but according to the

composition and quantity of measures, or, more precisely, according to the reports on them!

In our opinion, it is not only trivial regulation of the enterprises in questions of introducing technical equipment right down to compulsory planning from above of "fashionable" technical means, but also the psychology of "others'," "nobody's" money, brought about by the practice of forming funds for new technical equipment that contribute to the formation of such a paradoxical situation. As we know, this money is taken by the ministries out of the profit of enterprises and goes into the "common pot" and is depersonalized, and then is "sent down" to the same enterprises in the form of centralized capital investments, but in different proportions and according to subjective criteria. Ministry workers do not value these funds if only because they have not earned them. And for the managers of enterprises, centralized capital investments are not perceived as their own, "native" money since they are not directly linked to the actual results of their activity. The main concern is to spend it no matter what. If it is necessary it is acquired, and if it is not successful it is not necessary. And nobody worries about the funds that are tossed to the wind or are frozen.

As an analysis has shown, of a number of enterprises more than 90 percent of the expenditures on new technical equipment come precisely from centralized capital investments. The enterprises have not become accustomed to spending "their own" money, including through Gosbank loans, on new technical equipment.

The indifference to capital investments allotted for scientific and technical progress ends up in low rates of this progress and is camouflaged by noisy agitation campaigns whose basic purpose is to create the appearance of fruitful activity and impressive successes. Such campaigns are always parasites on the most progressive and most promising areas of scientific and technical progress, distorting their essence and transforming it into the opposite.

The substitution of the struggle for increasing the effectiveness of production through robotization with a campaign for overall loud publicity about robots inevitably led to a "robot show." They are developing not the designs of industrial robots and the areas of robotization where it is possible to obtain the greatest social and economic effect, but those where the report of success can be achieved most simply, easily and conveniently, and in areas that have already received much attention!

It is precisely here, in our opinion, that one can find the solution to the paradox: nominally unlimited possibilities of industrial robots--and tens of thousands of designs sent to the warehouse or directly to the dump.

No two robots are alike! They have too short a history to be able to have only merits and not have shortcomings. Inherent in today's domestic designs are such shortcomings as slow speed and poor reliability in operation, poor stability of positioning, and a high price for certain welding manipulators (up to 150,000-200,000 each). Even though practically every model is praised and declared a success, even when they do not exceed the level of the 1970's,

this means that there are no real incentives for improving robot equipment. And production with its strict laws inevitably sells off expensive, quite and not very reliable designs of robots, regardless of how hard we try to stop them.

There are many examples of deliveries of less reliable designs or even those which do not work. Thus in 1985 the Srednevolzhskiy Machine-Building Plant received 120 industrial robots produced by the Krasnyy Proletariy Plant for use with flexible modules. And all of them were rejected. The time of pressure on the blank piece was 12 seconds instead of 2 seconds according to the norms; the grips on certain models reached 10-15 millimeters while the requirements for precision of positioning were expressed in fractions of a millimeter. During control tests of robot equipment of this type at the manufacturing plant in a number of cases the movement mechanisms jammed up and one could see how weak they were. Degree of error in positioning was 5mm instead of 1mm according to the technical specifications and therefore the PR's could not pick up the blank pieces.

To be sure, many people think that it is sufficient to raise the workability of existing designs to the proper level by approving the quality of batching, conducting additional resource tests and so forth, and then the problem of effectiveness of robot equipment will basically be solved. It seems to us, however, that only the elimination of the shortcomings in and of itself will not solve anything. Something more is required: a revision of the existing concept of robotization.

Up to this point the PR has been considered primarily as a means of relieving people of monotonous and difficult, unattractive manual work, that is, like some kind of equivalent replacement for man in manual jobs. This apparently obvious interpretation, which is extremely attractive during the period of aggravation of the problems of the personnel shortage and the unpopularity of manual work, in and of itself is deeply erroneous. By following it we will inevitably focus not on increasing the technical and economic indicators of production but on imitating the actions of man, which are far from being the same thing. Replacing manual manipulation with automatic turns into a goal in itself--into robotization of production for the sake of the very fact of robotization.

Thus for a long time the majority of PR's were created as designs of the floor type, which was a result of the deliberate or nondeliberate imitation of man, who when working stands on the floor and services machine tools, since, of course, he cannot turn upside down. According to our data, PR's of the floor design comprise 53 percent of the overall number of them, another 39 percent are PR's that are attached to base units of equipment, and only 8 percent are mounted designs (on cranes and so forth).

Yet the floor models of PR's are the most inefficient and uneconomical, since they require considerable additional space, they create a psychological strain on the individual when performing the remaining operations of adjustment and servicing, and they have minimum possibilities of "multimachine tool" servicing. But in reality the PR's can work in any position, even "upside down."

Another result of the imitation of the actions of man is that PR's are used primarily for loading and unloading work. As we know, intensification of production is achieved primarily to improving product quality (the grade and the output of suitable items and parts) and the productivity of equipment, as well as the reduction of the overall number of production personnel. The technical policy directed toward creating PR's primarily for our auxiliary work from the very beginning" distances robot equipment from these most important sources of effectiveness. And providing robots for presses, single-position machine tools and so forth frequently leads to a reduction of their productivity as compared to the conditions with manual loading. There remains only one source of savings--the wages of the workers who have been released, but even this too frequently turns out to be "conventional." Almost 95 percent of the PR's of the floor type handle one unit of equipment each. Thus the zone of effect of 1 PR is limited to the works of one human being, and, consequently, the possible fund of savings is no more than one person's wages. This means that the maximum savings on wages as a result of the introduction of one loading-transportation PR is no more than 3,500-4,000 rubles with two-shift work. The actual savings are much lower because of many factors.

In the first place, only 54 percent of the PR's function in robotized complexes while the remaining 46 percent have been introduced individually, "scattered" here and there. With such a lack of comprehensiveness of automation, there are practically no savings on manual labor.

In the second place, even with a comprehensive approach the PR cannot fully replace man. Thus on metal-cutting machine tools, of the 12-15 service operations the PR performs only three: "remove-transfer-replace" and all the rest of them are still done by the workers. Consequently, it is possible to remove a person from the work zone only partially, and he should not lose wages for this--and so the real savings are reduced to a minimum. And, finally, although we proclaim the PR to be the most important means of automation of flexible, reorganized production, only 45 percent of the PR's are working with readjustments and the remaining 55 percent are set for one single item.

One can guess while the total expenditures on robotization usually are not calculated or are carefully concealed. Either so as not to spoil the appearance of well-being or out of noble motivations: since a person who is replaced by a PR loses his value for us, there is something sinister about speaking of the price of a PR.

But nonetheless what is the amount of expenditures on robotization? With the creation and enterprise of "robotized module" with automatic loading the cost of each PR is only 30-40 percent, and the rest is the cost of devices for orientation, loading, accumulation of items (we have to manufacture all this ourselves), control, and also expenditures on redesigning equipment, installation and adjustment and so forth. As a result, the average expenditures on the robotization of one machine tool, press and so forth amount to approximately 40,000-60,000 rubles, which entails additional operational expenditures of up to 8,000-10,000 rubles a year (amortization, repair, servicing). Frequently these expenditures are even greater--up to

60,000-90,000 rubles per robotized unit of equipment, since 40 percent of the industrial robots are designed and manufactured by the enterprise through its forces, under primitive conditions, and with excessive expenditures.

These data were obtained during the course of an analysis of the production processes at 52 enterprises where more than 600 PR's are functioning. It cannot be ruled out that with a favorable confluence of circumstances the application of a number of designs of PR's of the loading and transportation type can provide an acceptable social and economic effect. But on the whole, we are convinced, in the modern stage primary development and large-scale introduction of loading-transportation PR's is a strategic mistake in robotization. He produces very minimal social results and it clearly causes losses on the economic plane.

Why then do loading and transportation PR's comprise the majority of PR's that are introduced--more than 70 percent? Why does that production continue to increase? Thus the output of the aforementioned PR's by the Krasnyy Proletariy Plant is to increase fourfold as compared to 1985! There can only be one answer: because the existing economic mechanism makes people work for volumes of new technical equipment, for creating appearances, but not for final national economic results. The more so since it turns out that on the personal plane nobody ends up the loser. On the contrary, those managers who zealously push for total robotization, giving no thought to the real results, acquire a stable reputation as fighters for advanced and progressive technical equipment.

Those enterprises that consistently turn in favorable individual reports on robots along with statements about their high effectiveness are given a long-term opportunity to be on the crest of scientific and technical progress. And the main thing is that nobody complains about the lost millions, for they do not belong to anybody, they are "centralized." And if sometimes there are doubts and criticism of such methods, the "ironclad" argument is ready: just look at what they are doing in the West! Everything has been robotized long ago. We have lagged behind in robotization, and this should not be allowed. Hence the conclusion: it is necessary to spend more money on robotization.

If one looks at foreign experience not through the rose-colored glasses of advertising brochures, but at the real thing, the picture is not as pretty, but it is extremely instructive. At the congress entitled "Robot-86" in Brno, these figures were given. In England 44 percent of the firms engaged in robotization have declared failure, and this figure is reduced since far from every firm is willing to admit its mistakes and losses. About 22 percent of the firms have announced a rejection of the application of PR's until times are better, when the PR's are less expensive and improved.

There is nothing unexpected or shameful in this fact. The process of creating and introducing new technical equipment is always long and torturous and inevitably entails difficulties and failures. The processes of robotization in industrially developed Western countries are not all the same. On the one hand, the future of the PR is conditioned by the extremely broad front of research on the creation and perfection of new designs and the search for more effective applications for them--no amount of money is spared for this so that

they will not fall behind in terms of the technical level of the PR's or their quality. On the other hand, the objective difficulties of obtaining final results have predetermined the extremely cautious rates of multiplying these designs that have been created and of the increase in their overall number. According to estimates at this same "Robot-86" congress in Brno, there are now 95-100,000 PR's in the world--this is several times less than was expected by the middle of the 1980's even a couple of years ago. The overall number of PR's introduced in Japan (during all the years!) is approximately 9,000-10,000 (according to other estimates, up to 12,000-19,000) and in the United States there are even less, and these are mainly in the automotive industry, that is, mass production and not serious production.

Certain of our departments, which have not perfected a single design and have not found time to figure out where and how best to apply them, have used all their energy first to plan the actual rates of increase in the output of PR's and then to overfulfill these plans. During the 11th Five-Year Plan the annual output of PR's increased by a factor of more than 8.5. And this in and of itself, irrespective of technical and economic results, is passed off for scientific and technical progress and proof of the intensification of production.

The main distinction of the practice of robotization in our country and in a number of foreign countries is not so much the quantity of PR's as their composition and the structure of the fleet. During past years throughout the world there has been a radical change in the technical policy for robotization --from loading-transport PR's to technological PR's which do not simply imitate the actions of man but make it possible to perform technological operations more rapidly and better. The list of these operations is fairly long: precision and seam welding, cutting, soldering, gluing; local polishing, cleaning of surfaces, smoothing of seams, removal of rough spots; painting, application of galvanic coatings, and assembly.

Here one achieves primarily improvement of product quality--because of the stabilization and stricter adherence to technological conditions, which is difficult to achieve and practically impossible to control with manual technology. There is an increase in productivity as a result of the rapid actions, the load capacities, and the multiple hands of the PR. The majority of these processes are difficult and harmful to the health of humans. Therefore when PR's are introduced there is a possibility of completely removing man from high-temperature, toxic and dust-filled work zones.

A somewhat special instance on this plane are the assembly processes where the submitted designs of PR's have not yet produced convincing indications of improvement of quality or more rapid operation as compared to manual or mechanized assembly. But here too there is promising research, for example, on robotized assembly from several sides at one time.

There is every reason to think that these tendencies are both progressive and long-term. At the Robotokompleksy-85 exhibition in Moscow not a single one of the Western firms exhibited a single loading PR! The picture was the same at the Robot exhibition on Brno in 1986. And one could not but note that the tone is set not by Japanese or American firms, but by European firms who have

participated in the creation of the overall "robot agitation" but have worked more specifically and efficiently on how to obtain a maximum return from the application of PR's.

The welding PR's are now struggling to reach first place in the world. In Finland they comprise 55 percent of the overall number of designs introduced; in the FRG, using a number of enterprises as an example, the figure is more than 60 percent and 25 percent of all of these are PR's for contact welding only. A significant guarantee of success here is the replacement of systems of technical vision which they have tried to use for a number of years to follow the scene, with ultrasonic monitors which cost one-fourth as much and are more reliable to operate.

The higher potential capabilities of technological PR's for processing operations are generally known. But nonetheless these comprise less than 10 percent of our overall number, including welding PR's which amount to only 3 percent as compared to 70 percent for transportation and loading PR's.

The beginning of the revolutionary transformations in world robot construction is the time when, finally, a real basis was formed for high effectiveness of PR's--the creation of truly "robotized" technology for welding, soldering, painting, applying galvanic coatings and so forth. Following this course, we should make up for lost time not so much in the overall quantity of PR's as in the quality of the designs and their direction and in the creation of robotized technologies where one cannot do without PR's. To do this it is necessary to develop intensively on a planned basis "technological robot construction," with a clear determination of the tasks, the responsible parties, the deadlines and, if necessary, with the purchase of licenses. In this area it is necessary to adjust the existing comprehensive target programs for the development of robot equipment. It would be expedient to revise the organization and planning of the work of specialized organizations for robot construction, reorienting them to individual output of industrial robots for the creation of completed systems of machines and instruments--robotized complexes--with an evaluation of their activity according to the final results for the consumer.

When planning measures for robotization it should be mandatory for engineers to work out how they will be reflected in the basic production indicators: the quality of the final product, the productivity of the equipment (not on the scale of the robotized operation, but of the entire technological section), in the overall volume of workers in this section (shop). To do this it is necessary to improve the methods for calculating the effect.

In the sphere of introduction of robot equipment it is expedient to concentrate forces and funds at enterprises that have trained personnel and the necessary material base, and the main thing, where the necessary psychological climate has been created. Preference should be given to the creation of robotized complexes in newly created shops and when capacities of existing enterprises are being increased. This will make it possible to deal not with "released" workers in places where they have frequently "grown up from the roots" but a reduction of the need for personnel in places where it is difficult to find them. For the remaining enterprises it is not expedient

to have mandatory assignments for robotization. It would be better to grant them the right to decide these things for themselves, in keeping with their capabilities and needs.

The preferential development of robot equipment in machine building and instrument building was not conditioned by immediate needs; a decisive role here was played by the possibility of designing their own PR's, for which machine building is better prepared than, for example, the construction materials industry. Yet the weight of the standard blank piece for lathe work is commensurate with the weight of brick, and the necessary movements of manipulation are the same ("grasp-shift-place"), but the rest of the factors are in favor of robotizing the production of brick and not lathe parts. A lathe produces no more than 20-30 items during an hour and, consequently, the PR loads and unloads no more than this; but the productivity of a roasting furnace amounts to several thousand bricks per hour, and all of these must be moved, placed and so forth. The requirement for precision of positioning here is considerably less and the adjustment is simpler; the conditions for the labor of workers in robotized operations (high temperature, dust and gas content of the air, intensiveness of labor) are considerably worse. Therefore in these and many identical operations the effectiveness of robotization can be very high. For these reasons even in the near future we can expect extensive application of PR's in construction and the construction materials industry and also in furniture, wood and light industry and so forth. And we can not only expect this, but also contribute to it.

I have met many workers who have participated to one degree or another in the "robot show." One gets the impression that nobody has been very sad about the money and efforts that have been wasted. Almost nobody can see behind the robots in the warehouses and the dumps, the unconstructed housing or kindergartens, the purification installations of enterprises, or the critical shortage of good commodities and products. On this front there are no marked changes in the thinking and world view or in the style and methods of work, to which we are directed by the decisions of the 27th Party Congress. The motives advanced by these people are not very interesting and not very persuasive. One nuance is curious: frequently they refer to the fact that all of these nonworking PR's (like nonworking GPS) in fact are producing an effect which we do not take into account, for example, the social effect from improving the surroundings for personnel, which is imbued with the spirit of automation and is developed following the example of progressive new technical equipment. To be sure, there is also another category of workers, and they are mainly production managers. They give the following conclusions: since there is nowhere to obtain good new technical equipment (PR's, flexible "modules") they must take what they get: after all, they cannot sit still and continue to work with antediluvian automated means of production either! As a rule, these managers on the whole are devoted to the interests of production, they are actively seeking new paths, and they think that at their enterprises they can make good use of the robot equipment and flexible automated productions they receive without thinking about the additional efforts and money they may cost.

The third category is composed of those who are categorically against unjustified "robot agitation" and do not restrict their opinions to the

hallways alone. There are even more of these managers since the 27th Party Congress.

Speaking of the 27th Party Congress, M. S. Gorbachev named the lesson of truth as the first of the lessons we must learn. "A responsible analysis of the past clears away the path to the future while half-truths that gingerly go around sharp corners slow up the development of a realistic policy and impede our progress." These words pertain fully to robot equipment as well. We must take a realistic approach, have an objective analysis and develop clear-cut concepts of robotization of production, taking into account the socioeconomic effect.

FOOTNOTE

1. "Robots and Common Sense," IZOBRETATEL I RATSIONALIZATOR, No 4, 1986.

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PRODUCTION ASSOCIATION GENERAL DIRECTOR INTERVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 104-115

[Interview with Valentin Andreyevich Shibeko, general director of the Tekhnopribor Production Association (Mogilev) by Ye. L. Lysaya: "It's Time To Grow Up"]

[Text] "It is time to grow up, time to mature. I am speaking not only of the robots themselves which must be 'given an education' so that they will not be 'greenhorns' capable only of unskilled loading-unloading and transportation work, but, on a good professional level, can perform operations of welding, painting, assembling, cutting and so forth. We are speaking about the approach to solving the problem to robotization as a whole."

This in the most general form is the way the general secretary of the Mogilev Tekhnopribor Association, Valentin Andreyevich Shibeko, formulated his viewpoint. We asked him to express his ideas about ways of developing robot equipment and to share his experience in organizing the development and production of robots in the PO.

[Question] Would you be more concrete about your idea of how to improve the approach to robotization and the directions for it?

[Answer] I shall answer your question but before discussing that I should like to emphasize that I do not deny the need for what has been done in the first stage, although many mistakes have been made. Nonetheless this stage was vitally necessary. Now many people are ready to rush to the other side--to stigmatize the robots and completely reject them. Of course one must take a serious approach and interpret all the positive and negative tendencies in the first stage. But in no case can one completely reject what has been done. Even the fact that many different kinds of designs have been created finally has a positive side. There was a struggle of designs. There was a battle of designs. The best cinematic schemas and systems for control of robot equipment were discovered.

Western firms were also continuing to invest money in robot equipment, even though they have not received all of the advantages from it which they had

counted on. But without this it is impossible even to think of the modern stage of automation of production.

I am not in favor of robotization in general. There is no doubt that everything should be taken into account and everything should be directed toward obtaining the economic effect and acceptable time periods for recouping investments. Additionally, a great deal depends on the methods of calculation as well. Robots do not need housing, kindergartens, Pioneer camps, hospitals and so forth. We are speaking not only about the social, but also about the economic effect. Certain specialists speak ironically about this without good reason. Of course when calculating the effect one should envision not only all the expenditures on production, but also those for operation and technical servicing of robot equipment. In general it is necessary to have good, all-around methods of calculating the economic effect. The lack of these today is an impediment to robotization.

The work at consumer enterprises should begin with a correct selection of the object of robotization. It is necessary to have a preliminary analysis of the concrete conditions for production. They should be oriented toward making sure that the robot becomes an organic part of the technological process. And it is necessary to consider all conditions especially carefully if it is intended to use the robot equipment in existing production. One cannot ignore the existing arrangement of equipment, the dimensions of the production premises, and other conditions.

And yet there have been plenty of cases when the enterprise first acquired the technical equipment and only afterwards began to think about how to use it! And it is not always the production itself that is fully to blame for such poorly planned acquisition. The orders of the branch or subbranch have forced them to do this. Are these not the same organizational and economic shortcomings that we have encountered previously in the assimilation of new technical equipment?

Things proceeded in the old way in the distribution of robots as well: the technical equipment was dispersed in individual pieces among many consumers. Neither I as a general director of a PO nor the other managers of production collectives that deliver robot equipment can encroach upon the functions of planning and supply agencies. It seems to me that the first batches of principally new technical equipment should still be distributed by the manufacturers themselves. More precisely, it is necessary to give them the right to select from among the consumers qualified partners with whom they could work together on the assimilation and perfection of the new technical equipment.

In my opinion, one can now see an understanding of the need to change the approach to robotization and certain positive strides have been taken.

[Question] What do you have in mind?

[Answer] At least the creation of regional centers for robotization. They have already begun to operate in our branch.

[Question] In your opinion, what function should these centers perform? Where should they be created?

[Answer] The centers for robotization should help the consumer enterprises determine the object of robotization, consult on what preliminary technological and organizational preparation must be done before purchasing robot equipment, coordinate special conditions for delivery that are related to the specific features of the production of the consumer, and help in adjusting in the robots after they have been acquired.

Of course the organization of these centers are within the capabilities of productions that already have a certain amount of experience in solving problems of robotization. To create them in a void, simply by the stroke of an administrative pen is a fruitless undertaking. A production like an individual has a certain level of qualifications, although with respect to enterprises and associations this is rarely discussed. This level of qualifications also determines the possibility of solving various technical problems.

Our branch has taken the path of organizing robot centers at enterprises that create robots, including at our PO. But it seems to me that still the robot centers should not be associated with the branch, but should be nondepartmental, and should help in robotizing enterprises of all branches. It is possible that this function should be managed centrally, at the level of the bureau for machine building under the USSR Council of Ministers. Then all productions, regardless of their departmental jurisdiction, will be able to receive qualified assistance in assimilating robot equipment.

[Question] And which specific service in your association does the robotization center rest?

[Answer] So far we have not been able to carry out any organizational innovations. The same design and technological subdivisions as have existed in the past are now engaged in the performance of this function as well, since we are constrained within a strict framework of limits on labor resources that are determined by the territorial agencies. We have excellent production facilities and equipment, but the second shift is practically empty because we cannot get the people. And young people are willing to come to us, since they are interested in new, modern production, but we have to refuse to hire them. The PO has ended up between a rock and a hard place: the Ministry of Instrument Building, Automation and Control Systems insists on the development of the association but in the local areas they are demanding a reduction of personnel.... It seems to me that it is impossible to solve all problems at once--limits on the number of personnel should be established equally for all enterprises of the region. Instrument construction, machine tool building, electronics and electrical equipment are the basic branches of machine building for technical reequipment of the national economy and their proportional development has been determined by the 27th CPSU Congress. Now, to be sure, an assembly section of the Servis Trust of our Ministry for Instrument Building is being created in Mogilev, and they have means of automation and control systems which will help us in adjusting the robots for the clients.

[Question] Valentin Andreyevich, what is involved in the need to increase the number of personnel at your association and to what extent is this justified?

[Answer] Our association is quite young. It is only 12 years old. The equipment is the most modern, and we have no outdated technologies. The mechanics and assembly shops are equipped basically with machine tools with numerical program control. We are creating a flexible production system for metal processing. To use costly modern technical equipment basically on one shift is a crime. Our design and scientific subdivisions are developing.

But first the PO was thought of as the "technological shop" of the branch, whose task was to develop and create means of automation and nonstandard equipment for enterprises of the Ministry of the Instrument Making, Automation Equipment and Control Systems. But the association has outgrown this framework and produces new technical equipment for many branches of the national economy. We were the first in the country to master digital analogue transformers, with which machine tools with numerical program control can reach a new level of reliability. The PO creates control equipment and automatic assembly units that are used by enterprises of the branch for assembling Flowmasters, and automated machines for assembling condensers that are in demand both at enterprises of the Ministry of the Instrument Making, Automation Equipment and Control Systems and the Ministry of the Electronics Industry, the Ministry of the Automotive Industry and other branches.

Today, perhaps, our association is one of the largest suppliers of robots. We have been instructed to produce robots of the module type for the assembly of items in instrument building and the Zhgut-1 robot equipment complexes for cutting, marking and apportioning assembly wires into a large braid. For other branches we produce standard universal robots which can be used for welding and loading and unloading work. During the years of the 11th Five-Year Plan labor productivity increased by 29 percent. We are expanding work on new technological processes. We have introduced casting in smelted molds, which sharply reduced the volumes of mechanical processing of cast parts. We have introduced laser adjustment of microcircuits--the ASUTP adjustment period. We have seven computers participating in technological processes. Now the output of a new program on machine tools with numerical program control requires about an hour. We have set the task of reducing this time to 15-20 minutes. To do this we have created an ASUTP for preparing programs. Briefly, we are trying to do everything possible to automate production and reduce manual labor.

But we must not forget that there has been a sharp increase in requirements for product quality and reliability. Improvement of quality, as was noted at the June (1986) Plenum of the CPSU Central Committee, is a nationwide program. The PO has created a shop for quality whose purpose is to conduct additional testing of products under conditions close to those in which they will be used and, I would say, even close to critical ones--in tests of heat and cold and in pressure chambers. Since we do not always receive from the Ministry of the Electronics Industry batching items of the necessary quality input monitoring must be increased. We have also introduced electrothermal hardening of parts

and passports for the most important parts and components. All this produces an additional effect for the consumer and greater labor-intensiveness for us.

The second shift must also be completely staffed. I do not agree with the opinion that machine tools with numerical program control should work on three shifts. Let us look the matter straight in the eye: whether we like it or not, it is necessary to pay attention to the fact that today the level of machine tools with numerical program control still requires large expenditures of time for service. So it is better to use the third shift for servicing. Of course, flexible automated productions are another thing. Here the third shift is where the greatest effect is produced, where it is possible to have technology involving few or no people, if during the first two shifts production is prepared well for this. But there are not very many flexible automated productions in the country yet.

Finally, one cannot forget about the personnel who are taken away for agricultural work, construction, landscaping and so forth. After all, all these are people still. Honestly speaking, we are very alarmed about how we are going to manage under conditions of self-supporting production since many workers are being diverted. It seems to me that it is necessary to change over to self-supporting production in a different way.

[Question] In what way?

[Answer] In all branches at the same time. We shudder over each person who is taken away for outside work, for there nobody bears responsibility for their utilization. Of course, it is necessary to plant, to harvest the crop and to procure the hay. But this is taken to the absurd. At the plant they take a skilled worker because he has mastered the occupation of an agricultural machine operator, but then they use him as a personal chauffeur for the chairman of the kolkhoz. Or take construction. An engineer who is dragged away from his laboratory is put to work gathering up construction trash. But where, in what reports is it registered how many additional personnel they have at construction sites? How is this reflected in the labor productivity of the construction organization? And this should be reflected both in the financial activity and in the reports of output? Then these organizations would not take the assistance from industrial enterprises so lightly and irresponsibly.

[Question] Your product is one of the most important means of automation of production and reduction of the demand for labor resources. Has your association managed to "increase the qualifications" of robots, and what has been done and is being done about this?

[Answer] What is a robot as a design? Figuratively speaking, its head is the control system, and its arms are the kinematic system and execution mechanisms. Increasing the "qualifications" of robots is largely held up by the element base. Until recently it was formed on the basis of elements for general application that were produced even before robots made their appearance. In particular, the control systems for industrial robots were created mainly on the basis of control devices for machine tools with numerical program control. There were no special control systems for robot

equipment. Only recently have we begun to create such systems. This has been included in the work of our PO as well.

Robot equipment places special requirements on batching items. There is no need to explain how important it is for robots to have precise positioning, high reliability and speed of action or why it is necessary to miniaturize the batching items. To increase the "qualifications" of the robots, on the one hand, means to expand their functional capabilities--to "teach" them to perform with high quality the operations of assembly, welding, painting, measuring and so forth and, on the other hand, to raise the level of technological capabilities--precision, speed of action, reliability. The batching items that are being received do not contribute to the achievement of these goals.

Electronic elements that do not make it possible to provide for rapid action or a sufficient volume of memory for control devices when their miniaturization also holds things up. But the Ministry of the Machine Tool and Tool Building Industry and the Ministry of the Electrical Equipment Industry have also "tried their hand." We need more modern hydraulics, reduction gears and shifting devices, grips and working instruments. For the electric drive it is necessary to have small engines with high momentum and slow speed at the same time. The entire world is oriented toward the creation of such instruments. Because of the fact that they have high momentum they can be started and stopped quickly. If they also have good low speed engines, it is not necessary to devote as much attention to improving the wave reduction gears as is now the case. The wave reduction gears should slow the speed of a high-speed engine in order to provide for smoothness of the operation of the manipulator. But the Ministry of the Electrical Equipment Industry has not yet taken measures to provide high momentum, direct current engines even for the production of machine tools with numerical program control, although this began to develop much earlier than robot equipment did.

The association produced its first robots on the basis of the development of the Smolensk Scientific Research Institute Tekhnopribor with a control system from the Leningrad Electrical Machinery Plant, without a technical reinterpretation of the plan and, frankly, there was no real satisfaction in this product. Having analyzed the plan we decided to modernize the manipulator, make significant changes in it, and at the same time replace the control system. The work was done in creative cooperation with this institute and with the Belorussian Polytechnical and Physicotechnical Institute of the Belorussian SSR Academy of Sciences, Kiev State University, and the Institute of Applied Mathematics of the USSR Academy of Sciences.

[Question] What did the modernization consist of, and what was its goal?

[Answer] The goal of the work that was done was to expand the functional capabilities and technological possibilities of the robot.

We had to devote a great deal of attention to the wave reduction gears since the softness and smoothness of the actions of the robot depend on them, as does the precision of the positioning, in the final analysis. The reduction gears that were delivered for batching did not satisfy us. We decided to

create our own production of these items even though they are not meant to be produced in instrument building.

One can judge how important the functions of the reduction gears are from the following fact: when developing the production of robot equipment, Bulgaria purchased a plant for wave reduction gears from the Japanese. I especially went to Staraya Zagora to see how this plant was working. But when the specialists and I looked more deeply into the solution to the problem after I returned from Bulgaria, we became convinced that there was no need to import anything. In essence, everything necessary for the production of good reduction gears was in the hands of the Ministry of the Machine Tool and Tool Building industry: specialized enterprises for reduction gear construction as well as equipment. We even had the tooth polishing machines from the Yegoryevskiy Plant of the Ministry of the Machine Tool and Tool-Building Industry, which became the base equipment at our plant for producing these components. Having studied them more carefully, we are extremely surprised that the Yegoryevskiy workers said nothing when the Emblem of Quality was removed from the machine tool. In terms of the precision parameter, the machine tool was quite good. All that was necessary was a certain amount of modernization, particularly in the control of the machine tool.

We had to organize a special group of highly skilled workers and engineers who worked both under creative conditions and directly in the processing of the items on the tooth polishing machine. They managed to obtain reduction gears that were on a level with the best world standards in terms of the smoothness of operation, which was confirmed by the technical expert evaluation from the Kiev Institute VNII-Reduktor.

I am not discussing this in detail for the sake of praise. On the contrary, I am very much afraid that after the article appears in your magazine orders will come to us for wave reduction gears since they are a sore spot for many enterprises. I would just like to emphasize that for the production of new technical equipment it is necessary to provide incentives not only for the enterprises that produce the final product, but also for those that provide batching items. The search for such forms of incentives is in progress in the national economies of the socialist countries. In particular, the experience in creating unified incentive funds for new technical equipment were all collectives engaged in its production is of some interest. If the creators of the reduction gears were to bear this responsibility and were as interested in the final result of the creation of new technical means as the basic performers of the work are, they would probably be more enthusiastic in looking for possibilities of improving their products.

[Question] Tell us please about the system for control of the industrial robot that has been developed in the association.

[Answer] The kinematic circuit of the robots is, of course, very important. But with an equal technical level of all the circuits, all the other merits of robot equipment are provided by the control system. Until recently no special control systems had been created for robot equipment. The control devices for machine tools with numerical program control were used. In recent years there began to appear special control systems for robot equipment, for example, in

the Ministry of the Radio Industry. This is a complete system but it is oriented specifically toward one type of manipulators. It cannot be used with other manipulators. There are systems that are adapted for two modifications. In order to use these systems with other kinds of robot equipment, it takes a great deal of reworking. We have tried to create a universal system which can be used with various models of robots that have up to 8 degrees of mobility. To restructure them it is sufficient to replace only local program components. This is one peculiarity.

A second peculiarity is that this system relies fully on a domestic element base. One can understand how much easier this operation and servicing will be. The consumer plants are not made dependent on currency or on imported equipment.

The majority of systems that are being created are either cyclical or positional, and there are far too few contour systems which make it possible to perform not only transportation and loading functions, but also arc welding and certain assembly operations. We have created a positional-contour system necessary for robots of the universal type which can perform several operations--welding, polishing, processing of cast pieces, transportation and loading-unloading work. Everything depends on the program that is put in. We have called the system Progress-1-8 (1--the first modification, 8--the number of controlled coordinates).

Progress-1-8 was not constructed according to a classical plan. It is a multiprocessor system and therefore its computer capacity and productivity are increased. The domestic series-produced micro and minicomputers do not make it possible today to achieve rapid action for more than a million computer operations per second. Therefore we have taken the path of using in the system, in addition to the central processor, several microprocessors, each of which performs its own local task. We have created a movable panel, the so-called training panel, which makes it possible to create new programs while running the existing program. Also envisioned for the system is an apparatus for analytical programming for diagnosing breakdowns. It is not in the shop but in the individual premise, and can simultaneously serve as four control systems that are joined together by a single main line.

Progress-1-8 is an open system. It now consists of 12 microprocessors but, as the need occurs, it is possible to increase its capabilities at least to the point of utilizing 16 microprocessors. At the same time, the size of the system is one-third the size of our robots.

[Question] In what stage is the work on the Progress and how soon will computers be able to acquire it?

[Answer] Several models have been created. The interdepartmental commission has rated it highly. The Vitebsk Elektroizmeritel Plant, to whom we turned over the technical documentation for the Progress-1-8, is preparing for series production of the systems. But there are great difficulties with the acquisition of batching items from the Ministry of the Electrical Equipment Industry, which our specialists have already written about in the newspaper SOTSIALISTICHESKAYA INDUSTRIYA. The very title of the note "They Agreed In

Order To Refuse" reveals the essence of the conflict. Nonetheless I should still note that 5 years ago it would be impossible to do this development--there would have been nothing to coordinate. The system is based on the best achievements of the Ministry of the Electrical Equipment Industry for the element base of electronics. Therefore it seems to me to be a matter of honor for this ministry to fulfill its contractual commitments. It seems that we can no longer count on a complete series of 100 units, as was planned for 1987. But it is necessary to give Vitebsk a chance to develop series production.

[Question] Under the conditions of self-supporting production, the level of the technical equipment that is produced has an essential influence on the well-being of production--the increments for the best items and rebates from the outdated ones. And you give your best development to another enterprise. How do you explain this?

[Answer] We do this, of course, with great reluctance. I have already given you the main reason. In order to develop production of the Progress-1-8 we would have to increase our number of personnel. For before this we have not made control systems--we have put our robots together with LEMZ systems. The limit on the number of personnel makes it impossible for us to develop the output of Progress. Moreover, even in the production of robots under this five-year plan our volume will increase by a factor of 1.5. We have also earmarked a large amount of work for modernizing previously produced robots. We intend to replace the wave reduction gears and the shifting apparatus in the plants of the consumers.

Nonetheless you are undoubtedly right. It is a terrible thing to put a development which would provide for the material well-being of the association into the hands of others! To be sure, the Vitebsk Plant will make these systems primarily for work with our robots. Still it seems to me that we need an organizational community of interests of the developer and the manufacturer. Then it would be possible to realize the program for improving robot equipment more rapidly. Apparently it would be more expedient to include the Vitebsk Plant in our association than the Bobruisk Weight Plant. But the Bobruisk Plant is in Mogilev Oblast, while the Vitebsk Plant is in a neighboring oblast, even though they are both in the same republic. It is necessary to overcome such territorial barriers.

[Question] A number of the interdepartmental commission and the division chief of the Institute of Applied Mathematics of the USSR Academy of Sciences, Dr of Physicomathematical Sciences Aleksandr Konstantinovich Platonov, with whom I have had occasion to speak, responded very well to the progress-1-8 and considers the system to be one of the best in the CEMA countries, but he notes that there is still a large amount of work to do with respect to software. What do you have in mind?

[Answer] Yes, this is true. Without software any system is nothing more than a collection of metal and semiconductors. The mathematics have been completely developed for our modernized robot. But the Smolensk Scientific Research Institute Tekhnopribor, where all the development of robot equipment in our branch is basically concentrated, it is creating a number of new models

of manipulators, and this is also true of the other planning and design bureau which is working in conjunction with the MVTU imeni N. E. Bauman. But there are control systems for them. As I have already noted, the Progress-1-8 is a universal system and all that is needed for it is the development of local programs that depend directly on the peculiarities of the model of the manipulator, in other words, programs of the third level. Programs of this level will be developed and attached to the Progress-1-8 system by the Elektronmash NPO. And then it will be possible to say that the problem of software has been solved.

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PRODUCTIVITY OF ROBOTS EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 116-119

[Article by Yu. A. Gorodner and V. F. Zaluzhentsev, engineers of the Division for Automation and Mechanization of the Polet Production Association (Chelyabinsk): "What Reduces the Productivity of Robots?"]

[Text] The Chelyabinsk Polet Production Association has been working on robotization of production for more than 12 years. In the stamping, mechanical assembly, galvanizing and painting productions during this period they have introduced more than 45 robots and manipulators which altogether have produced an economic effect of more than 130,000 rubles and have released more than 60 workers. But, in spite of the obvious advantages of robotization, there are significant problems which are holding up the rates of introduction.

The Imperfection of the Design of Robots

The first problem is the lack of correspondence between the productivity and the durability of the constituent parts that link the "robot-mechanism." The robots are still not as productive as the forge-press equipment and they surpass the lathe equipment.

When they are joined together with forge-press equipment the productivity of the "robot-press" complex decreases. But with manual stamping of the body of an electric record player the press satisfied the daily need for production for one shift. This same assignment with the use of robots was done in two shifts, and there was always a significant risk of stoppage because of unforeseen breakdowns of the robot. When the robots were put together with lathe equipment, conversely, they stood idle waiting for the completion of the mechanical processing of the part. Here we find incomplete utilization of the calculated productivity of the robot.

One of the ways of eliminating the disproportions is to produce robots for a specific purpose in which the productivity would be close to the productivity of the equipment. At the same time, specialization of robots would make it possible to simplify their design and make them less expensive and easier to repair. There would be no need to produce universal, complicated robots and

manipulators that are able to handle all cases in life. Thus robots intended for cutting and bending parts could easily make do with three movements instead of the six planned for universal robots.

It would be even better if the robots were built into the equipment with which they are supposed to operate and were supplied with a set of auxiliary devices --grips, guiders, accumulators, trippers and so forth. Then one would have a right to speak of a robot technological complex (RTK) which would become an independent unit or module for creating flexible automated sections and productions. Such complexes, which are intended for specific purposes and are completely equipped with auxiliary devices, would be much easier to introduce into production.

At our enterprise we have designed a robot equipment module for cutting and bending small parts and, on the basis of this, we have created an entire section that consists of four complexes that are equipped with universal magnetic grips, guiders, trippers and accumulators. This complex has been introduced at other enterprises using our technical specifications. Thus the example confirms the possibility of centralized output of RTK's for specific purposes.

One of the crucial problems is the reliability of the robot, which should approach the reliability of the equipment working "as a pair" with it. The requirement of equal reliability does not extend to auxiliary equipment (accumulators, guiders, grips and so forth). Here the reliability should be calculated on the basis of the service life of the products that are produced. In our day the replacement of lathes for public consumption takes place every 5-7 years. Auxiliary devices should work reliably throughout this entire period.

The second problem. The time has come to change our view of robots as a means of mechanization intended for small-series production. The experience of many enterprises, including ours, has shown that the greatest effectiveness of robots comes precisely in large-series production. And this is no accident. The frequent changing of parts that is typical of small-series production leads to frequent readjustments of the robot equipment complexes, and this is complicated and disadvantageous since it requires significant time expenditures. The designs of complexes should envision ease of readjustment. It is necessary to have small mobile robots that meet the requirements of flexible production. In our practice we have encountered parts which initially could not be manufactured with robots, but after small design changes which play no significant role they became "robot-technological." The complicated configuration of new parts, components and multistage assemblies is broken down into elementary operations which can conveniently be performed with the help of robots.

The third problem is the training of personnel. While facilitating the labor of people and improving technological discipline, robots simultaneously place increased requirements on the professional training of personnel. Robotized complexes envision servicing numerous machines. A worker who previously ran only one machine tool mechanism doing one operation changes over to running several machines. And, although the worker is relieved of his previous

physical efforts, he has a great deal of psychological tension. Naturally, without preliminary training it is difficult to cope with the new tasks.

The system for repair of robot technological complexes and payment for repair workers becomes especially important. Repair services of enterprises still have a bad attitude toward the complexes, since they see an additional amount of work in them. In our opinion, it is necessary to envision additional payment for repair workers for servicing robots. We consider it most expedient to have a system of payment which would provide incentive for fulfilling production assignments in a robotized section of a complex or line. When performing planned assignments for robot technological complexes at our plant the repair workers were given an additional payment of up to 30 percent of their salary. This motivated them to maintain the complexes in a constant state of production readiness.

The fourth problem. A special place in the introduction of RTK's is occupied by problems of quality since the requirements for observing technological discipline are becoming increasingly strict. It is inadmissible to have deviations from the stipulated parameters in blank pieces and parts that come from other shops and greater requirements are placed on the quality of transportation and warehouse work as well as the control equipment.

Robotization brings forth new quality requirements for the planning of shops. They should include an area for the installation of robot-manipulators, panels, and auxiliary devices that provide for safety of operation.

The fifth problem. Many disputes are caused by the calculation of the economic effect obtained from the introduction of robot equipment. In our opinion, we should make a distinction between the effect from the introduction of robots at the level of the shop and at the level of the enterprise. And only the latter should be considered economically effect. The shop economic effect takes into account only shop expenditures on the introduction of robot equipment and only those savings which it has received. No attention is paid to savings produced by robotization in connection with the reduced expenditures on social and domestic needs, the protection of labor, safety techniques and so forth. Therefore the shop economic effect does not reflect the full picture and can be regarded as preliminary. The effectiveness from the introduction of robots should be evaluated only in terms of the complete economic effect.

As our experience shows, the aforementioned problems can be resolved completely.

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MINING, CONSTRUCTION ENTERPRISES LINKED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 120-126

[Article by Ye. B. Ivanov and Ye. A. Tikhomirov, Donetsk branch of the Scientific Research Mining Institute: "Common Interests of Mining and Construction Enterprises"]

[Text] The significance of comprehensive utilization of raw material increases each year, the more so since in recent years the effectiveness of mining has decreased as a result of its being moved to less favorable conditions.

The ways of solving this problem have much in common, regardless of the kind of mineral or the region where the mining enterprise is located.

We shall show this using the example of the refractory and nonore subbranch of ferrous metallurgy of the Ukrainian SSR. It has a large, well-prospected raw material base that is located close to the consumer. In the Ukraine enterprises of the Ukrogneuporenrud (RPO) extracts more than 35 percent of the refractory clay, 45.5 percent of the limes and dolomites and all of the kaolin for the needs of USSR ferrous metallurgy by the open pit method. But only 7 percent of the extracted rock mass goes for prepared products and the other 93 percent or 78 million tons is waste rock which is sent to the dumps. The RPO has allotted more than 14,000 hectares for mining enterprises. About 4,000 of these are outside dumps of stripped rock. But even after recultivation only part of this land can be turned over for arable land. So far only about one-fourth of the land has been recultivated.

The best deposits and sections are gradually being worked, and the less rich ones are being put into operation, and the areas covered by mine fields and dumps are increasing. This increases the production cost of products from mining enterprises and expenditures on recultivation. Thus in the past 10 years the production cost of refractory clay and kaolins has increased by a factor of almost 1.5.

One of the main directions for the neutralization of the negative consequences of the deterioration of natural conditions from the working of deposits is to extract other kinds of rock as well. The changeover to comprehensive

processing of deposits produces the best result when in addition to the mineral that is extracted, everything else is fully utilized and not accumulated in the warehouses, thus increasing above-normative supplies and worsening the economic and ecological situation at the mining enterprise.

As is shown by research conducted in our institute, a considerable proportion of the rock impurities in the deposits of refractory and fluxing raw material can be successfully used in the production of construction materials.

This problem has been raised repeatedly, but nothing has ever been done about it. Laboratory and industrial tests have shown the extensive possibilities of the utilization of low-grade clays and also substandard clays and kaolins in the production of cement, acid-resistant facing brick, slabs for floors sewage pipes, keramzit, and so forth. The reddish brown loams are suitable for obtaining autoclave wall materials and construction brick. Gravel from nonstandard limes and dolomites can be utilized expediently in road construction and wastes from enriching the basic product of flux production--in the cement industry. Moreover, the byproducts from enriching limes can be used as foundation materials at mining enterprises when doing underground mining work.

After determining the possible areas for the utilization of rock impurities it was necessary to reveal the need of various productions of these kinds of raw material. In first place here were the brick and cement productions, especially those that were suffering from a shortage of raw material. In brick plants, because of the shortage of raw material, production capacities are frequently underloaded, although the need for construction brick and facing slab is constantly increasing. The utilization of clays and kaolins that are plastic but are substandard for the refractory industry makes it possible not only to reduce the shortage of raw material, but also to improve the quality of the products of brick plants.

The cement industry, especially in recent years, has also been experiencing difficulty with clay raw material. The problem here is that, according to the requirements of cement production, the raw material must contain no less than 20 percent clay. In substandard refractory clays and kaolins, as a rule, the content is considerably more. The use of this raw material as a high aluminate correcting supplement for the production of Portland cement clinker completely corresponds to the interests of the cement industry. It will contribute to reducing the shortage of aluminate-containing charges and, moreover, will make it possible to reduce the production cost of cement and improve its quality.

But with all the obvious advantages of changing over to reduced-waste mining, there are a number of difficulties that arise mainly at the level of the enterprises. At the enterprises that extract refractory raw material, most of the covering rock is moved to the internal dumps directly by the excavators that are doing the stripping; no additional means of transportation are utilized. But with comprehensive assimilation of the deposits, it would be necessary to extract the impurities selectively and separately, and then load them separately for subsequent shipment. This complicates the technology, it slows down the preparatory mining work, and it could slow down the discovery

of the area of the basic mineral. As a result, the fulfillment of the plan of the basic production is threatened.

Moreover, the development of reduced-waste mining production is not always within the power of each individual enterprise. Putting impurities to work requires additional material and labor resources and fairly significant ones, since the impurities in the rock are 5-10 times greater than the basic mineral.

The potential consumers of the extra mineral, that is, enterprises of the construction industry, have their own difficulties. These, as a rule, are combines that consist of mining shops and processing plants. Changing them over to imported raw material makes it possible to partially or completely do without the services of their own mines. This is one of the positive results of changing over to comprehensive assimilation of deposits. But such a changeover is not always advantageous for the enterprises of the construction industry, especially when they have not arranged strong production ties between the supplier and consumer of the raw material and the production process of the supplier does not have the necessary stability. Moreover, there is a sharp increase in transportation expenditures and it becomes necessary to reconstruct old warehouses and construct new ones, as well as to acquire equipment for them, and the volume of nonproductive labor expenditures increases.

A successful and rapid changeover to reduced-waste production is possible only with a combination of the interests of mining enterprises and enterprises of the construction industry. How does one integrate these interests and make them correspond to national economic interests? How can material incentives of the collectives of workers--one of the effective levers for solving economic problems--be used for these purposes? A new form of utilization of profit from sales, whereby it is all used to form economic incentive funds for industrial enterprises producing consumer goods in addition to their basic products, has had a positive effect on the sharp increase in the production and expansion of the assortment of consumer goods. Transferring this experience to the extraction of raw material from byproduct minerals will make it possible not only to significantly increase the interest of the collectives of mining industries in comprehensive assimilation of deposits, but will also create conditions for keeping personnel in less profitable mining enterprises of the refractory industry, some of which even are planned to operate at a loss. Increasing the economic incentive funds as a result of the development of reduced-waste mining and complete utilization of extracted raw material byproducts will place mining enterprises in more favorable economic conditions and will make it possible to construct housing and social, cultural and domestic facilities as well as to retain personnel.

The changeover to reduced-waste production requires bringing in additional extraction and transportation equipment and creating warehouses to handle large quantities. What can be done here? First of all, some of the equipment for extraction can be obtained from enterprises of the construction industry after the mines have been covered over or the volumes of production of raw material in them have been decreased. Some of the technical equipment can be provided by the ministries themselves. They should be directly interested in

comprehensive assimilation of the deposits since this reduces the production cost of the main product of mining enterprises.

The question of creating accumulation warehouses, in our opinion, should be given special consideration. The construction of large warehouses at mining enterprises and enterprises of the construction industry not only requires considerable capital investments but also, obviously, is not very effective, since there is a sharp increase in nonproductive expenditures. It would be more expedient, in our opinion, to create base or regional accumulation storehouses. The raw material then would be delivered by the mining enterprises of the region and consumed by construction industry enterprises. It would not be difficult to select the most convenient place for the regional warehouses if this requirement is observed: do not locate warehouses on fruitful plowed land.

The funds for the construction of regional warehouses can be allotted on a cooperative basis by the interested ministries and departments. The expenditures of each of them on the creation of base warehouses will be less than if they were to construct and operate their own warehouses.

Giving the warehouse the status of a wholesale base and transferring it to the jurisdiction of local authorities, for example, the ispolkoms of rayon, city or oblast soviets, will contribute to improving the ecological and economic situation in the region and will correspond to branch and national economic interests. Local authorities will be able to influence the intensification of the process of comprehensive assimilation of the deposits of minerals and also the utilization of the rock impurities since this, in addition to everything else, corresponds to the requirements of increasing the circulation of warehouse supplies at the base under their jurisdiction. The most varied measures of influence are possible--from administrative to direct assistance in solving various production problems. Thus the local authorities will be able to assign means of transportation and people employed in agriculture to mining enterprises and construction industry enterprises during the winter period in order to carry out the shipments. This measure can be carried out on a mutually advantageous basis if, for example, enterprises of the construction industry establish privileged conditions for granting to agricultural organizations rendering them assistance, construction materials that are in short supply, say, without limits from the above-plan products that are produced.

There is another advantage to putting the regional warehouses under the jurisdiction of local authorities. The ispolkoms of rayon and city soviets allot land for industrial development of generally widespread minerals. Since they are in charge of the regional warehouses, they will have a considerably better idea of the possibility of satisfying the needs for raw materials and therefore will take a more substantiated approach to allotting land for mines of enterprises of the construction industry. And, finally, if its prices for raw material from impurities found along with minerals are set by price divisions of the oblispolkoms, this will make it possible not only to reduce the time it takes to establish them, which in and of itself is fairly important, but will also provide for the necessary flexibility of prices.

Also important are the direct contacts that arise here between mining enterprises and construction industry enterprises, the accounting for the requirements of the consumers and the capabilities of the producers, and the combination of their mutual interests. As is shown by our work conducted in the Kirovograd Mining Administration in order to put substandard iron-containing kaolin to use in the cement industry, direct contact with the Zdolbunov Cement and Slate Combine made it possible to conduct laboratory and experimental industrial testing on the material in a short period of time and develop technical requirements for its quality. We took into account the interests of the Kirovograd Mining Administration concerning the expansion of the utilization of low-grade kaolin which had a limited sales market. Previously for years it had been accumulated in the warehouses. Taking this into account, the DonNIGRI in conjunction with the Kirovograd Mining Administration developed technology for preparing from iron-containing and low-grade kaolin a raw material mixture whose quality fully meets the requirements of cement production. Industrial tests of this mixture showed the effectiveness of its utilization in the production of Portland cement clinkers. A plan of technical specifications was developed and the wholesale price was established. Close contact between the mining administration and the combine significantly reduced the time periods for the assimilation of the production of kaolin for the cement industry and industrial utilization of it at the cement combine. Incidentally, it began to be used almost a half-year before the wholesale price for kaolin in the cement industry, having gone through all the coordinating tests, was established by the Ukrainian SSR Committee for Prices. The total economic effect at both enterprises from the production and utilization of kaolin for the cement industry during 1982-1983 amounted to about 150,000 rubles. Industrial production and utilization of kaolin for the cement industry made it possible to include in the balance supplies about 2 million tons of Kirovograd substandard iron-containing kaolin. The economic effect from this exceeded 1.4 million rubles.

Expansion of the range of producers of raw material for the cement industry will make it possible to put cement plants in touch with the sources of raw material and significantly reduce the amount of shipping. Territorial assignment of consumers and producers of raw material strengthens direct ties between them and reduces the period for assimilation of reduced-waste mining production. Both consumers and producers stand to gain from this.

When evaluating the economic effect of this from the utilization of impurities in the production of construction brick an economic and mathematical model was used. As a result of the calculations they established zones where the utilization of highly plastic clay raw material found in deposits of the refractory subbranch of ferrous metallurgy in the Ukrainian SSR will be effective. For even incomplete satisfaction of the needs for this kind of raw material will make it possible to increase the production of construction brick and, which is especially important, improve its quality. Adding only 15-20 percent of highly plastic and plastic clays and kaolins to the charge for the production of construction brick reduces the volume of breakage to one-fifth and improves the quality by as much. At the same time, using only one-fifth of the impurities in the rock will make it possible to reduce the production cost of one ton of refractory clays and kaolins by 8-10 percent.

The savings from this at six mining enterprises included in the Ukrogneuprnerud RPO will be about 1-1.5 million rubles.

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PHILOSOPHICAL VIEW OF ECONOMIC THEORY PRESENTED

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[Discussion by A. P. Butenko, doctor of philosophical sciences, professor, chief of division for general problems of world socialism of the Institute of Economics of the World Socialist System of the USSR Academy of Sciences (Moscow): "Rejecting Dogmas and Studying Contradictions"]

[Text] Also social scientists who are representatives of economic and philosophical sciences know the truth that adherence to Marxist-Leninist teaching consists not in repeating their arguments and conclusions but in creative development of these on the basis of experience that has been accumulated. Marxism is not a dogma, but a guideline to action. "In this classical point," wrote V. I. Lenin, "we see emphasized with remarkable force and expressiveness an aspect of Marxism we almost always lose sight of. And by losing sight of this we make Marxism one-sided, distorted and dead, we take out its soul and we undermine its radical theoretical foundations--dialectics, and teaching about historical development that is comprehensive and full of contradictions; we undermine its link with certain practical tasks of the age which can change with each new turn of history." (Footnote 1) The political report of the CPSU Central Committee to the 27th Congress and the new edition of the CPSU Program have provided examples of creative enrichment of social science on the basis of practice, and have demonstrated the possibility and capability of deepening and enriching Marxist-Leninist theory, taking into account the needs of life.

At the center of attention in all theoretical thought today is a complicated process of the most diverse problems ensuing from the modern turning point in the development of our society and the world as a whole. It is precisely this special segment of the historical process, that "new turning point in history" that is being experienced by the Soviet society and the entire world that requires from each of us creativity and innovation, readiness and the ability to go beyond the framework of concepts that are customary but have outlived their usefulness. In this situation life places special requirements on social sciences.

What is the modern condition of Soviet social studies, how are essential problems of socioeconomic development analyzed and resolved in them, and how closely related is our social science, above all economic theory, to practice?

When presenting the political report at the 27th CPSU Congress General Secretary of the CPSU Central Committee M. S. Gorbachev said: "We cannot avoid the fact that our philosophical and economic front, and social science as a whole, is in a condition, I would say, of a certain remoteness from the demands of life. Moreover, our planning and economic agencies and other departments are not showing the proper interest in implementing the reasonable proposals of social scientists."

What is the reason for this situation? It would be incorrect to think that the clear lack of correspondence of the development of social science is caused by the inadequacy of scientific personnel, a result of their inadequate activity and poor organization of research. The main reason, in our opinion, lies elsewhere: of course the entire atmosphere that has prevailed in the country up until recently, an atmosphere in which achievements are admired and mistakes are ignored, the "propaganda of success" and the concealment of failures, an atmosphere of complacency and a lack of desire to fight to resolve the increasingly difficult problems, to put it lightly, has not contributed to the development of science and has not stimulated its creative search for solutions to crucial problems.

The development of social sciences is an indispensable part of the development of the society. In a situation where problems of the development of the country have increased more rapidly than they have been solved, where inertia, stagnation of forms and methods of management, reduction of dynamism in work and increased bureaucratism have caused a good deal of harm, where when stagnation has made its way into the life of the society, many branches of social science have begun to forfeit their scientific nature. And it could not have been otherwise. When in the central agencies and local areas a unique kind of psychology has taken the upper hand--how to improve things without doing anything--social science has begun to be transformed into a servant of official "propaganda of success." Moreover, in such a stagnant atmosphere, the people entering social science and coming to the fore are not those who are capable of correctly, meaning critically, evaluating the situation in society, but those who have become accustomed to "smoothing out" sharp corners, who have been ready to forfeit scientific principles for the sake of being of service, who have tried to convince themselves and others that social science is not the most difficult creative search for solutions to new tasks and problems that require both mental strain and scientific courage as well as adherence to principles, but an extremely easy teaching and repetition of Marxist formulas and slogans, a public demonstration of their "devotion to the party" by means of approving official documents and, on occasion, applying labels to people who think alike. The people gaining the upper hand in social sciences have not been those who have hungered for knowledge but those who, being afraid of the truth, have been ready to settle for half-truths at best. And a half-truth is especially dangerous because of its ease of acceptance and because of the fact that it, like a lie, does not make it possible to draw correct conclusions.

Therefore, the conclusion arrived at in the political report of the CPSU Central Committee at the 27th Congress concerning the lesson of truth that is taught by history is especially important for the social sciences. We must be fully aware that where there is no truth there is no science. And if society indeed needs social science--and without its creative development there can be neither a correct understanding of what is going on nor a scientific vision of the future--then it must deal with the fact that the social sciences themselves in order to develop successfully need not only the appropriate social atmosphere and a "demand" for their "product" as well as accounting for their substantiated recommendations (without this social sciences lose track of their goal and points of reference), but they also need correct information which is necessary for generalizing, a struggle of opinions, and the right to be mistaken which is inherent in any science. In his day Engels wrote: "In order not to become a sect we must allow discussion, but general principles must always be observed." (Footnote 2)

The political report of the CPSU Central Committee to the Party Congress, the discussions at the congress, and the documents adopted by the congress touch on many solved and unsolved problems, problems that are solved correctly and incorrectly, difficulties existing in science, erroneous positions and prejudices. Naturally, the 27th CPSU Congress could not and did not try to deal with the situation in each branch of social science, offering this possibility to the corresponding institutions, institutes, councils and collectives. At the congress they singled out only a few of the theoretical issues that are most important for practical work. It was stated at the congress: "In the work for restructuring the economy and the economic mechanism it is more important to rely on science than ever before. On the basis of the requirements of life it is necessary to take a fresh look at certain theoretical ideas and concepts. This pertains to such large problems as the interaction of productive forces and production relations, socialist property and economic forms of realizing it, commodity and monetary relations, the combination of centralism and independence of economic organizations, and so forth."

Not limiting itself to appeals, the 27th CPSU Congress made an essential and fundamental contribution to the theoretical development of Marxist-Leninist theory and to the solutions to many extremely important problems of social science: political economics and philosophy, history and scientific communism, and the theory of state and law. But it would be incorrect to think that this in itself already solves problems of social science. To think this means to drag social science into its previous positions and change it from a creative science into a variety of propaganda which engages not in independent development of problems, but only clarification of party policy, its conclusions and its instructions. It would be incorrect not to see that there exists a danger of such backward movement of social sciences: for there are still many people, lacking the desire or ability to resolve problems of social development creatively, are prepared to canonize the conclusions of the congress and transform its decisions from guidelines into a set of new dogma, whose repetition is supposed to replace the necessary deepening and development of our knowledge in all areas of social thought.

It is impossible in one article to consider even the most important questions of economic science that require a new interpretation and deeper scientific development. I shall discuss only two interrelated issues--the contradictions and the dialectic of productive forces and production relations. It says in the program adopted by the 27th CPSU Congress: "Scientific analysis of objective contradictions of the socialist society and the development of fundamental recommendations for resolving them and reliable economic and social prognoses are an indispensable task of social sciences in the modern stage of development." Here it is repeatedly emphasized that the attention of social scientists should be concentrated on the study and comprehensive analysis of the "dialectic of productive forces and production relations."

It is necessary to think about this point in order to understand how far public recognition of social contradictions has progressed: for today even certain "naysayers" with doubtful intentions assert the contradictions of the new system and the party itself is calling for social scientists to study the contradictions of socialism. Today various authors consider the first of the contradictions of socialism to be the interaction of productive forces and production relations, and the party Program calls for concentrating attention of social scientists on a comprehensive analysis of the dialectic of productive forces and production relations.

Hardly anyone who follows the development of social sciences has forgotten that during the time of the discussion of the contradiction of socialism and the essence of its basic contradiction a viewpoint was expressed according to which the basic contradiction of socialism is the contradiction of the socialist method of production, namely the contradiction between the growing productive forces of society and the real system of socialist production relations that exist in the society. (Footnote 3) Those who defended its viewpoint knew (and wrote about) the fact that under the conditions of the cult of the personality, there predominated the condition that "under socialism one would have a complete correspondence between production relations and productive forces (this thesis actually opened up the possibility of analyzing the lax of correspondence and contradictions that arise within the method of production)." (Footnote 4)

Of course any position or viewpoint expressed during the course of an argument can be questionable. This is a basic truth. Therefore there is nothing strange about the circumstance that the viewpoint concerning the key significance for socialism of the contradiction between productive forces and production relations was disputed. The only thing surprising is where and how it was disputed.

Since the viewpoint presented above touched upon the "holy of holies" of certain theoreticians who were fed along with their mother's milk the idea of "complete correspondence" between productive forces and production relations under socialism, these theoreticians decided to throw in their "heavy artillery," relying if not on scientific arguments then on political outcry to close the mouths of those who in their research penetrated too far into the essence of the matter--to the origins of the stagnation of that time and the decline in the rates of economic growth of the USSR.

Thus in an article entitled "Social Sciences: Certain Aspects of Discussions, Criticism and Self-Criticism," the author ridicules the very argument about the contradictions of socialism, declaring: "One can judge how much it has enriched our science from the fact that its participants have finally reached agreement that every formation, including the communist formation, can have only one (!) basic contradiction." (Footnote 5) Denying the key significance for socialism of the contradiction between productive forces and production relations, this same author expressed this doubt: "Are we really pushing forward if we regard as the basic contradiction of socialism the contradiction that is inherent in all socioeconomic formation between productive forces and production relations." (Footnote 6) It is not difficult to guess that the author was trying once again to "close" this problem as one that does not exist in socialism.

After this "criticism" not even a half year passed before it became clear to anyone that its claims to express the official position were groundless: even in December 1984 in a speech by M. S. Gorbachev entitled "The Living Creativity of the People," presented at the All-Union Scientific and Practical Conference, it was precisely the "interaction of productive forces and socialist production relations" that was called the "radical and crucial problem," and dogmatic ideas concerning the interpretation of this problem that were harmful to theory and practice were criticized. "What is the matter here?" he asked in his paper. "Is it not that the analysis of production relations is frequently carried out separately from the real condition of productive forces and the practical activity of the people? As a result, there arises some kind of circumspect stagnant image of production relations as an unchanging essence which is far from reality." (Footnote 7)

But in this stage authoritative criticism did not become a point of departure for eliminating the mistakes. To become convinced of this it is sufficient to leaf through the philosophy and economics journals that have been published since then. To be sure, after that articles appeared by those who, confusing a formal-legal generalization with real assimilation and real improvement of socialist production relations, advised having the state take over cooperative property, curtailing commodity-monetary relations, and replacing value measurements with physical ones. (Footnote 8)

It is no accident that in the political report of the CPSU Central Committee to the 27th Party Congress a significant place was devoted to erroneous ideas that are related directly or indirectly to the interpretation of the dialectic of productive forces and production relations.

We know that Marx and Engels regarded productive forces and production relations as two sides of the method of productions that were inseparable for one another and represent only two different aspects of the development of social man. Moreover, according to Marxism, each step in the development of productive forces, by changing the mode of labor and influencing public labor productivity, through it, that is, through the mode of labor, influences the entire system of productive relations. By the same token any change in the system of production relations, in one way or another affecting the practical energy of the people and the mode of their labor, is reflected in their productive forces.

In order for these ideas not to remain within the framework of theoretical abstraction alone, let us illustrate them with an example. Let us say that a new means of labor has been created--large electric power stations that produce less expensive electric energy. The very creation of these electric power stations and their inclusion in the country's energy system means, in the first place, the inclusion of a new sum of consumer values in exchange (kilowatt-hours of electric energy); in the second place, since here electric energy is produced with fewer expenditures, throughout the society there are changes in the socially necessary amount of time of production (cost) of a kilowatt-hour of electric energy; in the third place, since the cost of electric energy is included to a greater or lesser degree in the cost of any produced product, this causes a wave-like change in all previous measurements and ratios of commodities. Consequently, throughout the entire system of industrial economic relations (production, exchange, distribution, and consumption) there is a change, a restructuring, a wave of changes roll through, gradually dying down far away from the epicenter but never equaling zero. In a similar way one can illustrate the way any change in the elements of production relations (for instance, a change in prices for individual kinds of products) by stimulating their production in a good or bad way, affects in one direction or another the organization of labor, its effectiveness and its productivity, that is, the productive forces of the society.

Thus productive forces and production relations as two aspects of a single mode of production are inseparable and indivisible in their constant concrete interaction. The initial theoretical mistake which caused serious harm to the political economics of socialism and to all social sciences consisted in the separation of the dialectic of production relations and productive forces, in the severing of production relations from productive forces, in the transformation of these from an internally inseparable form of development of productive forces into an externally separate envelope that could be removed from productive forces, granting them the possibility and some time to develop without production relations. This mistake was also contained in the generally accepted imprecise initial formula according to which socialist production relations "gives faith" for the development of productive forces. For in this formula there is the implicit idea of production relations as some kind of receptacle where there is "space," a "clearance" between the framework of this receptacle and its content--productive forces whose development, independent of this framework (production relations) in any stage, must "select" this "clearance," exhaust this "space" in order then to come in contact again with production relations. With this understanding it turns out as though the interaction of production relations and productive forces is not continuous but a discrete process and, consequently, there are strips of development when, on the one hand, productive forces develop without changes in production relation (and it turns out that these are the periods of the most rapid development of productive forces without any restraints) and, on the other, that production relations remain as some kind of "unchanged essences," that are free of the influence of productive forces throughout this entire period.

But the aforementioned formula (the first thesis) does not exhaust the erroneous concept under consideration and expresses even more clearly a number

of other erroneous ideas and prejudices, namely: the thesis of the "more rapid development" of socialist production relations over productive forces and also the thesis about the three qualitative changes in production relations on the path from capitalism to communism and, finally, the thesis that equates socialist appropriation by the workers of the means of production with their formal-legal collectivization (this thesis is the point of departure and the culmination of this entire erroneous concept). Let us consider these theses.

I wish to remind you of what it says regarding this in the political report of the CPSU Central Committee to the 27th Party Congress: "Practice has shown the groundlessness of ideas according to which under socialist conditions the correspondence between production relations and the nature of productive forces is provided automatically."

Which ideas are they speaking about in terms of groundlessness?

They are speaking primarily about the fact that there has been an erroneous viewpoint which in direct or indirect form defends the thesis according to which after nationalization (state takeover) private capitalist property and cooperation with private property of the peasants over a long period provides for a correspondence between production relations and the nature of productive forces which requires no special effort on the part of the society until there arises the question of these two forms of socialist property coming together and merging into one--nationwide, communist.

Moreover, in a considerable proportion of Soviet philosophical and economic literature, the opinion that socialist relations "outstrip" the development of productive forces has become rooted. According to this opinion, in countries with a relatively low level of the material and technical base, that is, the production-technical apparatus, the totality of implements of labor, all substantial elements of productive forces, nationalization and cooperation in means of production in and of themselves mean the creation of socialist production relations which will immediately go far ahead of the level of productive forces that have been achieved here.

With this approach, the socialist production relations that have been established since the end of the transition period are regarded as a kind of social "envelope" which provides not simply space, but an immense space for the development of productive forces since it has proceeded far ahead of their development. Hence it goes without saying that over the entire phase of socialism social development takes place mainly through multiplying socialist property, increasing it, and improving the material and technical base. But in this case is there a need somehow to restructure production relations, to improve them, is the distance between them and the lagging productive forces is already great enough? It follows that one should wait until the productive forces grow to such an extent that the "envelope" can no longer accommodate them, thus requiring the coming together and merging of two forms of socialist property into one--communist property.

Related to this second erroneous thesis is the third one. Its essence amounts to the fact that when changing over from capitalism to communism production relations undergo qualitative changes three times: the first time, when

private capitalist ownership of the means of production is nationalized, the state takes over and transforms it into state property. The second time is when small private property of the peasants, and small landowners is joined into cooperatives and transformed into collective property. And the third time is after the victory of socialism when productive forces develop fairly rapidly and cause a coming together and merging of the two forms of socialist property into one--communist property.

It is also thought that after each of these qualitative changes space is opened up for development that is characterized only by a growth of productive forces, for they must exhaust the space granted to them by production relations. But it is precisely this understanding that regards production relations not as something that is subject to constant change and development in keeping with the growth of productive forces but is some "unchanging essence" which lags behind until time itself, and only in a particular stage, subjects it to qualitatively restructuring.

Naturally, with such a metaphysical approach any position which regards the fundamental contradiction of the socialist social structure in the mode of production, in the dialectical interaction of productive forces and production relations, seems "not very productive," "not producing very much" for daily practice, for with such an approach it is assumed that this basic contradiction "does not work" in daily life since one is aware of it only at the turning points of development, that is, only when bourgeois relations are replaced with socialist and socialist-communist relations.

This idea about socialist production relations, which depicts them in the form of some kind of "payment for growth," which makes them look like a broad box in which the incubation and development of productive forces takes place, stands in contradiction to the point made by Marx to the effect that production relations can never be higher than the development of productive forces. (Footnote 9) And the gnoseological basis for this mistake is the confusion of formal-legal and actual collectivization, the confusion of the development and multiplication of the object of socialist property and the development of socialist property itself as the totality of production relations, which can be singled out as one more erroneous thesis.

The nationalization and the transformation of means of production into the property of the socialist state is a most important point of departure for the creation of the socialist economy, for this revolutionary act, in the first place, actually deprives the exploiters of means of production, deprives them of that part of ownership of the means of production which was the basis of the exploitation of man by man; in the second place, it creates state ownership of the means of production. But nationalization as a legal act determines only the formal-legal, and not the real socialist collectivization of the means of production. Strictly delimiting these processes, V. I. Lenin wrote: "But the hitch is that even the greatest 'resoluteness' in the world is not enough to change over from nationalization and confiscation to collectivization." (Footnote 10) For real collectivization presupposes not a formal legal, but a practical appropriation by the workers of the means of production and public wealth which legitimately belong to them. And this is

the result not of a one-time, arbitrary, state-legal act, but the product of long and torturous socioeconomic development.

In light of this, any discussion of the inadequacy of the material and technical base of one socialist country or another to its production relations lack any scientific or practical meaning. They lack meaning primarily because the first in the interaction are productive forces and not production relations, and these latter, being a form of development of productive forces, develop in connection with productive forces, on the basis of their changes and in keeping with them, and therefore there can be no such inadequacy ("outstripping" production relations) in nature.

But it is not just a matter of theory. The practical harm of the point of view that is being criticized can consist in that here what is desired is passed off for reality: the not yet complete real collectivization and appropriation by the workers of the means of production was passed off as something that had already taken place. This generated and gave substance to a placidity with respect to improvement of production relations.

In fact, if with nationalization and cooperation with means of production socialist production relations were created, and there was more rapid development of productive forces, at least two conclusions followed from this.

First, in this case the dialectic of interaction of productive forces and productive relations appeared in "inverted form": the primary thing became not the improvement of production relations but the development and proliferation of productive forces, which enabled the society to rest "light-heartedly" on its laurels and develop within the framework of the already created system of production relations until the growing productive forces exhausted the existing "space," that is, until they "bumped up against" the boundaries of the forms of socialist property that were separated from one another--national and cooperative, requiring that they come together and, finally, merge into one--communist property.

In the second place, with this approach it was possible to assert that the development of the major productive force--man--is taken into account by the improvement of economic conditions in the sense that along with him there was also a development of socialist property, since there was a growth and proliferation of the object of socialist property--the substantial factors of production.

Both of these assertions were erroneous for, in the first place, in life there is not nor can there be an "inverted" dialectic of productive forces and production relations and, in the second place, the growth and proliferation of the object of socialist property in this case is not the development of production relations but the development of productive forces. But it is not only a matter of the error, but also that thus attention was diverted from the main thing, from the need for delivered and prompt improvement of production relations, for in real life this does not take place automatically.

In fact, what kind of actual situation existed here in the interaction between productive forces and productive relations? It was certainly not

characterized by having production relations "outstrip" the development of productive forces, with the former being far ahead and acting as "payment for growth," offering the society the opportunity not to be concerned about improvement and development of production relations.

Formal-legal collectivization ("socialization") of means of production--nationalization and cooperation in them, having eliminated private capital and small peasant private property--actually created conditions for the formation of new production relations, but these new relations could come about only in the way in which they were allowed to come about by the real character and level of development of productive forces and the means of labor inherent in the given stage. In brief, real production relations were established in the only way they could have been on the basis of the existing conditions of production and means of labor. For the Soviet Union--and later also for the majority of other socialist countries with their relatively low level of development of productive forces and a significant predominance of manual labor and peasant population who were being urged toward a radical increase in material production by capitalism (initially by capitalist surroundings and the danger of intervention--for the USSR and later--by the constant pressure from imperialism and the threat of its aggression--for all world socialism)--only one possibility was opened up: to enter on the path of rapid progress through extensive growth factors, which also meant the formation of an entire system of real production relations, a mechanism for management, and principles of planning and control of the economy that corresponded to this possibility. Since the level of development of productive forces--substantial and personal factors of production were not high since manual labor was widespread in the society and the main creator of public wealth was labor in its direct form as an expenditure by the workers was the main agent of production, primarily their muscular energy--corresponding to this stage was also an economic mechanism that was characterized by expenditure directed primarily toward quantitative, gross indicators with a technocratic approach to the human factor.

Under these conditions live labor was still subordinate to inanimate, embodied labor, for the latter not only dictated and preserved the forms of social division of labor, but also made it impossible actually to overcome the dichotomy of people of mental and physical labor in the sense that the functions of organization and management of production remained separated from the actual producers who were "loaded" in production activity, and counterposed them to their controllers (the ministers, managers of trusts, directors of enterprises and so forth).

It was precisely within the framework of this real system of production relations, adapted to that level of development of productive forces, that rapid growth of production was accomplished, the material base of society was created and developed, and the man of socialism developed. With time these forms of production relations began to exhaust their capabilities and began to be transformed into an impediment.

But the incorrect understanding of the dialectic of productive forces and production relations that prevailed in the society made it impossible to gain a correct understanding of the essence that was taking place: it was thought

that the "actual" production relations would not impede productive forces and would correspond to their level of development. But in reality the situation was different. "Life is becoming more and complicated," as was stated at the 27th Party Congress. "And socialist production relations are opening up the space for the development of productive forces. But to do this they must be constantly improved. And this means that it is necessary to promptly take note of outdated management methods and replace them with new ones."

What does this mean in practice?

In order to answer this question correctly, it is important to keep in mind that production and economic relations in the society comprised an entire system of production relations, exchange, distribution, and consumption; and various units of this system are linked in various ways, and they also interact with productive forces and other aspects of the social organism: for instance, distribution relations (the system of wages, bonuses and so forth), as a rule, exert a more rapid and effective influence on the functioning of productive forces than do direct relations of production and labor, although these latter, by reflecting their relationship to property more clearly, exert their own more stable and long-term influence. It is also important to see the lack of uniformity in the changes in individual units of our system of production relations: when economic reforms are carried out in a socialist society, or even when various state documents or decrees (for instance, concerning price changes, better incentives for labor that is needed by the society, changes in methods of planning and so forth) are implemented, certain units of production relations undergo changes while others do not, that is, they remain in their previous form for a longer time.

As a result of such irregular change in various units of the entire system of production relations, a real situation has taken form in which certain aspects of production relations in their existing form still stimulate the development of productive forces and create possibilities for their rapid growth, while other aspects of production relations have already lost or are losing their stimulating role. For example, initially the very act of confiscation and nationalization of the means of production generates enthusiasm of the masses since because of this action there is an actual elimination of private property and the exploitation that is associated with it. But afterwards this fact is no longer enough: it is necessary to take practical steps for real assimilation by the workers of the nationalized means of production.

If the society represented by its state-administrative agencies does not study the condition of the real system of new production relations and does not see the exhaustion of the stimulating influences of various units of production relations or, because of neglecting these problems, enables a situation where the units of the system of production relations no longer stimulate but, on the contrary, impede the development of productive forces and no measures are taken (precisely the situation that existed in the Soviet Union during the 1970's and 1980's), then there is a retardation of the development of productive forces, the rates of economic growth slowed down, and difficulties and tension in the society increased. The aforementioned mistakes have closed off the path to scientific analysis of the main object of the political economy of socialism--the socialist method of production, its basic

contradiction and the problems of its practical development. M. S. Gorbachev said at the All-Union Conference of Heads of Departments of Social Sciences, "the party is counting on a growing contribution from economic science to our struggle for the development of productive forces, the application of leading technologies, qualitative improvement of production relations, and a change in the forms of management and control." (Footnote 11) Unless we overcome the mistakes that have been made it will be impossible to correctly understand the basic constituent parts of the socialist method of production or their real interaction, and this means that it will also be impossible to have a correct orientation of practical actions and, along with this, the necessary acceleration of our society's socioeconomic development.

FOOTNOTES

1. Lenin, V. I., "Poln. Sobr. Soch." [Collected Works], Vol 20, p 84.
2. Marx, K., and Engels, F., "Soch." [Works], Vol 22, p 426.
3. See: Butenko, A. P., "On the Contradictions of Socialism as a Social Structure," VOPROSY FILOSOFII, No 10, 1982, p 21. A similar position was expressed by V. S. Semenov and others (see VOPROSY FILOSOFII, Nos 7 and 9, 1982; VOPROSY FILOSOFII, No 2, 1984, and so forth).
4. See VOPROSY FILOSOFII, No 2, 1984, p 126. One can see that this estimate of the previously existing attitudes was not an exaggeration, if only from the fact that in 1940 one of the theoreticians wrote about the idea that the contradiction between productive forces and production relations had been completely resolved by socialism (see: Zalkind, I., "On Actual and Imaginary Contradictions Under Socialism," POD ZNAMENEM MARKSIZMA, No 6, 1940, p 71).
5. Kuzmenko, V., "Social Science: Certain Aspects of Discussions, Criticism and Self-Criticism," KOMMUNIST, No 11, 1984, p 112.
6. Ibid.
7. Gorbachev, M. S., "Zhivoye tvorchestvo naroda" [The Living Creativity of the People], Politizdat, 1984, p 12.
8. See Kosolotov, R. I., "Crucial Problems of the Concept of Developed Socialism," SOTSIOLOGICHESKIYE ISSLEDOVANIYA, No 82, 1985, pp 14-21.
9. Marx, K., and Engels, F., "Soch." [Works], Vol 13, p 7.
10. Lenin, V. I., "Poln. Sobr. Soch.," Vol 36, p 293.
11. KOMMUNIST, No 15, 1986, p 4.

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JOB, WORK FORCE BALANCE EXAMINED

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[Article by V. Ya. Churakov, doctor of economic sciences, All-Russian Scientific Research Institute of Economics, Labor and Management in Agriculture (Moscow): "Work Places and Labor Resources"]

[Text] In the system of management of the national economy an important place is occupied by questions of balance between the branch formation of work places and territorial reproduction of labor resources. The coordination of these two processes has traditionally been one of the "bottlenecks" in centralized planning.

The Existing Situation

It is of primary importance to take the following peculiarities into account.

In the first place, during the process of branch formation of work places and territorial labor resources certain contradictions arise and are reproduced. With a lack of accounting for planning and predictions of the formation of work places, when estimates of the number of personnel and the composition of labor resources up until the 1980's were limited to five-year periods, these contradictions were not promptly discovered and resolved, which caused negative socioeconomic consequences. As a result of the changes in the conditions for reproduction of the population, there is now an essential reduction of the natural growth of the country's labor resources. Of the overall increase of the population aged 20-60 in the country during the past 30 years, 30 million people are included in the first half (1971-1985) and about 5 million in the second half (1986-2000). The country is changing over from conditions of constant high growth of labor resources to conditions in which this growth is practically lacking, that is, conditions of labor provision for the national economy are changing radically. (Footnote 1)

In the second place, there has been an essential shift of the labor potential in the various regions of the country. If the territory of the USSR were divided into three large regions--West, East and Southeast--the number of population in these territories during the period of 1959-1980 would have increased as follows (1959-100): the West--116.4, the East--125.8 and the

Southeast--160.5. In the country as a whole this indicator was 126.7. (Footnote 2) By the end of the current century it is expected that the population will increase a great deal in certain regions (especially in Central Asia) and will decrease significantly in others (over a large part of the European territory of the USSR).

In the third place, a considerable period of time, equal to about 2 decades, passes from the time of the generation of the contradictions between the work places and the labor resources and their actual manifestation in the various regions of the country. The formation of labor resources like work places goes through a number of stages, and the contradictions manifest themselves only in the final stage of this process. Taking into account the fact that prediction and planned control of these long-term processes requires a period of no less than 20 years, one can say that the formation of work places during 1960-1980 took place without adequate substantiation. Because of this fairly significant contradictions between these processes will be arising in the socioeconomic development of the regions of the country for the entire course of the next 15 years, that is, up to the end of this century.

In the fourth place, the imperfection of the theoretical-methodological support for planning and control of these processes might be considered to be the reason for the unfavorable consequences. It is necessary to move promptly, even in the stage of the origin of the contradictions and establish scientific hypotheses that explain the causes of the shortage of labor resources in the national economy. But we do not have the appropriate methodology.

Fifth, the problem of employment is frequently regarded in a one-sided manner. The majority of work devoted to this problem considers employment from narrow economic positions of providing the national economy with a work force. Here arises the problem of maximum participation of labor resources in the sphere of public production. But the employment of the population takes into account other socially necessary and useful functions. Thus in the current stage of the development of the economy there is an objective need for employment in the private subsidiary sphere (Footnote 3) and work at home. An important role in the system of employment of women of child-bearing age is played by their performance of reproductive functions. For this reason there are significant differences in the structure of employment of various sociodemographic groups of the population in various regions of the country.

Extreme Concepts

In socioeconomic literature there are various positions in the understanding and evaluation of the level of labor provision for the national economy and the social consequences of this phenomenon. The so-called demographic explanation of the shortage of labor resources in the national economy has become widespread. According to this concept, the main reason for the shortage of labor resources in the national economy lies in the deterioration of the demographic situation because of the reduction of the birth rate and the natural increase of the able-bodied population. "The development of public production began to encounter difficulties in providing the labor force. The reason for this is the reduction of the natural increase in labor

resources and the almost complete utilization of the reserves of the work force that exists in private subsidiary business...in solving the problem of providing the national economy with personnel, in addition to revealing and efficiently utilizing intraproduction reserves of work force, it is important to provide for a proper level of increase of the population." (Footnote 4) But, as the corresponding predictions show, this "proper" level of increase of the able-bodied population in the country is not expected before the end of the current century. Such an explanation of the causes of the imbalance creates a "blind alley" situation: the cause of the shortage of labor resources lies in the reduction of the birth rate, and the society has not yet learned to regulate the natural growth of the population and increase the birth rate to the "proper" amounts.

Evaluations of the natural growth of labor resources during the past 30 years published by V. I. Perevedentsev make it possible to assert that the demographic situation formed in the country in the 1970's had nothing to do with the shortage of labor resources that appeared during these years in the national economy. Moreover, the demographic situation objectively even contributed to its reduction. During the years of the 9th and 10th Five-Year Plans in the country as a whole, including in regions with inadequate labor force, the growth of the able-bodied population was higher than it had been during all the postwar years. During 1971-1980 the growth of the able-bodied population ages 20 to 60 amounted to 22.3 million people in the country, including 13.8 million people during the years of the 10th Five-Year Plan. The "demographic" concept does not provide an answer to the basic question: why was there a great shortage of labor resources during this period that was extremely favorable from the standpoint of the growth of labor resources in the country and especially in the RSFSR, the Ukraine, Belorussia and the Baltic Republic?

Another concept that is shared by many researches of socioeconomic problems of labor asserts that the national economy as a whole is provided with a work force. If there is a shortage of labor resources in individual branches and regions the reason for this lies in the imperfection of the organization and incentives for labor at enterprises, in branches and in departments. Since the difference between the evaluations of the need of the national economy for labor force by the USSR Gosplan and the actual number of workers at enterprises is an insignificant amount, on this basis conclusions are drawn to the effect that the reason for the shortage of labor resources lies in the desire of managers of enterprises and departments to create easier conditions for fulfilling the production program. (Footnote 5) Of course improving the organization of labor and production and strengthening labor and production discipline in the work place, in the brigade, in the shop and at the enterprise are exceptionally important for increasing labor productivity and for using the available work force effectively. Moreover, without organization and strengthening of labor discipline it is impossible for the national economy to function effectively. And if the reason for the lack of provision of the national economy with a work force were only interproduction problems of organization and incentives for labor, a reduction of losses and nonproductive expenditures of the work time of the workers would be sufficient to solve this problem.

Indeed, with our current volumes of production, if the human factor were put to work and the workers' labor and social activity were increased, the demand for labor force would be significantly less. Therefore the mobilization of the noncapital-intensive reserve for increasing the effectiveness of public production at the level of the enterprises and branches is an important area for work for improving the employment of labor resources. At the same time the problem of employment cannot be reduced simply to questions of releasing workers and utilizing expenditures of live labor economically. In the process of reproduction objective prerequisites are created for complete and efficient utilization not only of live labor, but also of past labor that is embodied in means of production.

At the Basis--The Work Places

In the process of controlling the employment of workers it is necessary to perform the following individual tasks:

the provision of labor resources for work places;

the provision of work places with labor force;

qualitative correspondence between work places and labor force;

provision of a socially normal level of functioning of the work force of the worker;

provision of a socially normal level of utilization of past labor that is embodied in means of production.

Along with the final solution to the problem of unemployment in the country, more than a half century ago and the subsequent provision of full employment of the workers, at the present time it is becoming especially crucial to solve the problem of utilizing accumulated means of production completely and effectively, increasing the coefficient of shift work, and eliminating the possibilities of significant amounts of idle time of production capital. Being an important reserve for increasing labor productivity and increasing the effectiveness of the utilization of part of the means of production that is "provided with labor," measures for improving intraproduction organization of labor alone will not provide labor force for the vacant work places at the enterprises, in the branch or in the national economy as a whole.

Under the conditions of a planned economy there is a real possibility of providing the national economy with labor resources in all branches and regions of the country under the conditions of any demographic situation. A decisive influence on the imbalance is exerted by extensive formation of work places that are not provided for by the natural increase in labor resources in the branches and departments, and the weak interconnection between branch planning of work places and the territorial formation of labor resources and the reproduction of the population. When reporting, accounting and planning of work places are not well arranged it is difficult to expect balance between the structure formed in the branches and departments and the number of work places, on the one hand, and the reproduction of the population, on the other.

This imbalance at the present time should be regarded not as a result of the reduction of the natural growth of labor resources, or even as a problem of a shortage of labor resources, but as a problem of creating vacant work places that are not provided with work force.

In the interaction of economic, reproductive and demographic processes there arise numerous contradictions whose prompt disclosure and resolution are of great practical significance. Thus evaluations of the level of provision of labor force for various regions of the country through the system of territorial balances of labor resources and work places shows the continuation of the imbalance between the structure of work places and the labor force.

The formation of work places and labor resources in the various regions is augmented by interregional redistribution, migration and the accelerated outflow of population from rural regions to the cities and industrial centers. Branches of the agroindustrial complex (APK) are experiencing the shortage of labor force especially critically in the current decade. Because of the lack of coordination between the accelerated extensive formation of work places in the branches and departments and the slow, "dying" natural growth of labor resources, in branches and spheres of the country's APK alone under the last five-year plan, according to our estimates, there were 8.6 million work places that were vacant and not provided with labor force, including Poland (Footnote 6):

Sphere 1 (production of means of production)--1 million work places;

Sphere 2 (agricultural)--6 million work places;

Sphere 3 (branches processing agricultural products--light and the food industry)--1.6 million work places.

Most of these work places are concentrated in the RSFSR, the UkrSSR and the BSSR. An extremely difficult situation with respect to providing the APK with labor force developed during this decade in the Urals, the Central Chernozem and other regions of the RSFSR.

The classification of regions according to the ratio between labor resources and work places makes it possible to group the large diversity of situations and this means to systematize the practical measures for resolving the contradictions between the demographic potential and the system of work places.

Materials from reports and predictions of the balances of labor resources in the various economic regions of the RSFSR and the rural administrative regions of the Lithuanian SSR, the Mordovian ASSR, Altay Kray, and Novosibirsk, Moscow and Voronezh oblasts show that they can be divided into five classes of regions, depending on the level of provision of labor for the farms:

1--with an absolute surplus of labor resources;

2--with a relative surplus of labor resources;

3--regions with a relative equality between the number of labor resources and the number of jobs;

4--with a relative shortage of labor resources;

5--with an absolute shortage of labor resources.

The increase in the proportion of regions in the fourth and fifth groups during the current decade considerably expands the scale of the net socioeconomic problems:

when there are considerably more work places than labor resources a situation is created whereby the vacant work places "look for" and frequently do not find workers. This causes high unplanned mobility of workers, their territorial-branch redistribution, and "enticements" while maintaining and continuing the imbalance in large regions of the country;

a reduction of the effectiveness of the utilization of fixed production capital. As a result of the shortage of labor resources in the branches and spheres of material production, at the present time considerable volumes of fixed capital are "frozen";

increased incomplete construction and temporary "freezing" of capital investments as a result of prolonging the actual time period by a factor of 1.5-2 as compared to the normative;

exceeding the socially normal limits of the total employment of workers and reduction of the free time of the workers. At the present time the total employment of one able-bodied kolkhoz worker in the UkrSSR, the BSSR, the Latvian SSR and the RSFSR amount to more than 2,400 man-hours per year, while there is not a single economic region in the RSFSR where it less than 2,100 man-hours. For comparison let us point out that the norm for workers and employees recommended by the USSR Gosplan was set at the level of 1,900 man-hours per year;

rendering patronage assistance to kolkhoz-sovkhoz production from workers of cities and industrial centers not only during harvest season, but also during other periods of the year;

increasing nonplanned mobility and migration of labor resources, labor turnover, reduction of labor and production discipline and other social consequences;

when the number of work places with low prestige exceeds the number of workers with appropriate qualifications and the work in these spheres of employment is not given the appropriate compensation and considerable proportion of the fulfillment of socially useful functions of these spheres is redistributed into the so-called left economy (seasonal construction brigade, private repair of passenger vehicles and other forms of "private labor" (with all the socioeconomic consequences that ensue).

A different range and content of socioeconomic problems are reproduced in regions of the first and second groups: a low level of employment in the sphere of labor productivity, high "reproductive" employment of the female population, low territorial-branch mobility of the population, above all of natives, inadequate social mobility of the population, and others.

On the Path to Balance

The negative consequences became possible because of the imperfection of planning and coordination of branch and territorial reproduction processes. The Basic Directions for the Economic and Social Development of the USSR During 1986-1990 and the Period Up to the Year 2000 adopted by the 27th CPSU Congress earmarked a broad program of improvement of management of the national economy. In Section XII, "Distribution of Productive Forces and Development of the Economies of the Union Republics," the task is set "to provide in the branch and territorial cross-sections for correspondence between a number of work places and the available labor resources." In this connection it is necessary to take immediate measures for improving centralized planning.

In order to control migration processes, to regulate the differences in the standards of living of the workers, to distribute new productions and enterprises and to solve a number of other problems, it has become widespread in literature and the practice of planning to divide the regions of the country into those with a surplus of labor and those with a shortage of labor. Yet the existing evaluations of the provision of labor for the regions, including the construction of territorial balances of labor resources by statistical agencies in the cross-section of the oblasts, krais and ASSR's, do not make it possible to evaluate the level of provision of labor resources for the national economy. The current schema and method for constructing report balances of labor resources of the territory do not register the availability of work places and the need for labor resources in order to perform the actual volume of work on the territory under consideration.

When developing a system for reporting territorial balances of labor resources, there has been and still is an implicit reference to the idea that the actual number of workers in the branches and spheres of employment registered in the outgoing part of the balance of labor resources corresponds to the need for them in the national economy of the territory. This reference remains unsubstantiated and in reality the actual number of workers is significantly different from the needs of the national economy for labor force on this territory. This reference has gone "unnoticed" under conditions in which the national economy has not experienced a shortage of labor resources and under conditions of mainly extensive development of the national economy. During this period, by means of the "residual of the balance sheet"--the number of employees and the proportion of labor resources employed in private subsidiary and home business--it has become possible to indirectly rank the regions according to the level of provision with labor. Under modern conditions when extensive reserves of labor force in the majority of regions of the country have been exhausted and the proportion of the "balance sheet residual" of labor resources in the regions has dropped to the lowest possible level, there is no longer any possibility of obtaining even such imperfect

comparative evaluations of the levels of division of labor for the various regions.

When evaluating both the actual and the planned provision of labor, they do not take into account the need for labor expenditures on private subsidiary farms. Many years of scientific disputes concerning the socioeconomic essence of the private subsidiary farm in practice have led to a situation where immense masses of socially necessary labor and work time have not been reflected in the system of reports and planned balances of labor resources. The overall provision of the national economy with work force has been considered to be significantly higher than it is. At one time when the time budgets of industrial workers were being investigated by Siberian researchers, labor expenditures on private subsidiary farms were regarded as expenditures of labor in housework and were included with nonworking time. This was a correct interpretation of the content of these labor expenditures for the given socioeconomic group of workers. But subsequently certain researchers mechanically transferred a similar situation, which was correct for certain economic conditions, to other socioeconomic groups, particularly to kolkhoz workers. Such an erroneous interpretation of the socioeconomic meaning of labor expenditures on private subsidiary farms in the total employment of kolkhoz workers became widespread in socioeconomic literature. It is reflected in all of the latest investigations of the time budget that have been conducted by statistical agencies where labor expenditures on the private subsidiary farms of kolkhoz workers are included in nonworking time--as a part of the expenditures on keeping house. (Footnote 7)

Labor expenditures on the private subsidiary farms of kolkhoz workers and industrial workers in their gardens, even if they are carried out with the same implements of labor, play different socioeconomic roles. For industrial workers labor on a garden plot has mainly social and health functions. Income from this activity amounts to only 0.7 percent of the total income of such families (Footnote 8), and the necessary product comes in the form of wages and from public consumption funds. Another role is played by labor on the private subsidiary farm under the conditions of the kolkhoz family. It is part of the total expenditures of working time. On a private subsidiary farm they create a considerable portion of the necessary product not only in value terms but, which is especially important, in physical terms in the form of animal husbandry products, vegetables, potatoes and other products.

A calculation of the actual labor expenditures on a private subsidiary farm is important for more than just analyzing the total employment. No less important is the ideological side of this problem. The imperfection of the methodology and methods of accounting for expenditures of time on a private subsidiary farm can be used as proof of the high labor productivity in this sphere of employment. Indeed, if according to the data of statistical agencies, 26 percent of the gross agricultural product is produced on private subsidiary farms (LPKh) and only 3.9 million people or 14.4 percent of the labor force for agricultural production is employed on them, it is not difficult to figure out that the effectiveness of labor expenditures on LPKh's are considerably higher than on public kolkhozes and sovkhozes. (Footnote 9) Moreover, figures from the reference work entitled "The USSR Population" show that the effectiveness of production on private subsidiary farms in the USSR

increases more rapidly than in large-scale, highly mechanized kolkhoz-sovkhoz production. From the data from this reference it follows that in 1960 33 percent of all the agricultural products were produced on LPKh's and employment on them amounted to only 20 percent of the overall number of people employed in agriculture in the country. The effectiveness of labor on LPKh's was even more "significant" in 1980 when 23 percent of the agricultural products were produced there and the proportion of the overall number of people employed in agriculture was only 2 percent. (Footnote 10)

Everything falls into place, however, if one compares indicators that are really comparable, that is, if one takes into account the entire volume of agricultural products and all total expenditures of labor of all members of families in private subsidiary farming. The actual expenditures of working time on private subsidiary farms at the present time amount to a total of 29 billion man-hours throughout the entire country, or 14 million year-round workers (Footnote 11), which amounts to 37.9 percent of all the total labor expenditures in the agricultural branch. Taking into account all total labor expenditures, the effectiveness of private subsidiary farming turns out to be significantly less than that of public farming.

The private subsidiary farm is an element of socialist production relations and its functioning is impossible outside the framework of these relations; and there are no reasons to reduce the number of members of our society who are employed in it and certainly not to "increase" its effectiveness by means of an imperfect methodology.

The methods used at the present time for calculating the need for labor force do not provide for complete or effective utilization of past labor that is embodied in the means of production. An immense production potential has been created in the country's national economy. The value of fixed production capital alone in 1984 amounted to 1.489 trillion rubles. But how many working hands are needed to put these means of production to work, what number of workplaces are envisioned by this capital, how much labor force is necessary for complete and effective utilization of this material and technical potential? To what degree does the structure of production capital and its technical construction correspond to the modern increasing requirements placed on youth? What proportion of the production capital and work places that have been planned, formed and introduced at the present time will be provided with a work force and to what degree will they be provided with labor resources in the year they are put into operation? These and many other questions are facing the practice of planning and are not being answered because of the lack of accounting, reporting, predicting and planning work places.

The task of measuring the quantitative and qualitative evaluation of the ability of the workers to work--the work force--continues to be a methodologically unsolved problem. The existing methods of evaluating the labor potential and the supply of work force are extremely imperfect and do not provide for solving a broad range of practical problems having to do with establishing and maintaining balanced development of the economies of the regions. Thus the practice of planning and the statistical agencies, when evaluating the actual and predicted number of labor resources and when developing report and planning territorial balances of labor resources,

include in the income part of the balance all population 16-59 years of age (for men) and 16-54 years (for women) with the exception of disabled people of groups 1 and 2 who do not work and pensioners who are receiving a pension under privileged conditions. Moreover, the labor resources include adolescents and elderly people according to their actual employment in the public economy. (Footnote 12)

Thus the criterion for the availability of labor force in one group of the population or another and for including them among the labor resources in this case is not actually their ability to work, but their age, that is, an indirect indicator of the availability of labor force.

Moreover, a position has become widespread, according to which it is thought that the greatest ability for labor is found in young workers and as individuals grow older the supply of their labor force decreases. This concept, which reflects their level of development of productive forces during the first years of Soviet power, when the need for simple muscle power frequently came to the fore and was acceptable even for that period, only with a number of reservations, is hopelessly outdated at the present time and appears as a dogma.

Our research shows that it is not youth but individuals 40-50 years of age who have the greatest ability for skilled labor and the greatest supply of labor force. Estimates of the supply of labor force of workers in industry and agriculture in a number of oblasts of the Nonchernozem Zone of the RSFSR show that if the ability for skilled labor of the average worker is taken as 1.0, workers of various sociodemographic groups have the following coefficients:

| | <u>Industry</u> | <u>Agriculture</u> |
|----------------------------------|-----------------|--------------------|
| Workers up to 19 years of age | 0.73 | 0.64 |
| Workers up to 20-24 years of age | 0.99 | 0.74 |
| Workers up to 25-29 years of age | 1.11 | 0.97 |
| Workers up to 30-39 years of age | 1.15 | 1.06 |
| Workers up to 40-49 years of age | 1.16 | 1.12 |
| Workers up to 50-59 years of age | 1.07 | 0.96 |
| Workers 50 years and older | 0.90 | -- |

The calculation of the real supplies of labor force in the able-bodied population of various regions of the country would make it possible to promptly reveal the qualitative discrepancies between the work places and the labor resources of various regions (the shortage of youth, skilled personnel, the shortage of men in some regions and, conversely, a surplus in others, the surplus of pre-pension age people, surplus of female workers, and so forth).

In the practice of statistical and planning agencies the lack of accounting and planning for such indicators as the "work place" and "work force"--most important elements in socioeconomic and demographic processes--precludes the possibility of predicting these interconnections, promptly resolving discrepancies that arise and influencing these processes in a planned way in the interests of increasing the socioeconomic effectiveness of the production and employment of the workers.

Of course, this kind of discrepancy is relative in nature and through the system of measures of operational intervention the society provides for the necessary "coordination" of these processes. But it is quite obvious that an imbalance like this arises and reaches an immense scale before it is "discovered" by means of the existing imperfect methods and the system of indicators, and the socioeconomic price of such a coordination is too high to leave the practice of this kind of accounting and planning of these processes unchanged.

Work Places--For People

An indispensable condition for complete utilization of production capital is the provision of labor force for it. But the planning, construction and startup of enterprises are done without accounting for the expected changes in the condition of labor resources. The certification and accounting for work places being conducted at the present time in industry are exceptionally important. But they make it possible to provide an evaluation of the level of balance of the work places and workers only within the framework of the branch. Because of the existing reduction of the natural increase in population, radical changes are taking place in the conditions for reproduction both of the resources of the country as a whole and those in individual branches and spheres of employment. Under the conditions of the exclusive branch approach to the balance of work places and labor resources it is impossible to predict the availability of labor force for the branch even within the 5-year period.

At the present time a number of measures are being taken to reduce this kind of imbalance: production construction on the old technical basis is not allowed, and capital investments are being redistributed in favor of reconstruction of enterprises. But with the lack of a mechanism for unified control of the formation of production capital in labor resources, where work places are not taken into account and are not planned in many branches, under the conditions of a lack of territorial balances of labor resources and work places, there is no confidence that this balance will be provided.

Therefore in the mechanism for balancing the formation of production capital and labor resources it is important to have a system of indicators of "work places," and expansion of the limits of their application by the practice of accounting, planning and prognosis--not only within the branches of industry, but also in all other branches and regions of the country. The Basic Directions for the Economic and Social Development of the USSR During 1986-1990 and the Period up to the Year 200 earmark as one of the basic tasks "to create a unified statewide system of planning, accounting, certification and streamlining of work places."

The need of the national economy for labor force is derived from the number of total work places created in the branches and spheres of employment and the socially necessary level of shift work of the utilization of means of production. Under the conditions of an essential reduction of the natural increase of labor resources there is no possibility of enlisting additional labor force. Therefore it is necessary during the process of the creation of

new work places and the reconstruction of existing ones to take into account predictions of the demographic and labor potential of the country as a whole, including in the various regions for no less than 20 years into the future.

FOOTNOTES

1. Perevedentsev, V. I., "270 Millionov" [270 Million], Moscow, 1982, p 37.
2. Ibid., p 45.
3. In 1980 13.6 million families of kolkhoz workers and 10.1 million families of workers and employees of sovkhoses as well as 8.8 million families of workers and employees of other branches of the national economy had farmstead plots. If one takes into account the corresponding coefficients of the size of the families, the overall number of population in the country involved to one degree or another in private subsidiary farming during the years of the 11th Five-Year Plan amounted to 123.3 million people. This estimate is given from the books: "Lichnoye podsobnoye khozyaystvo" [The Private Subsidiary Farm], Moscow, 1981, pp 10-11; "Chislennost i sostav naseleniya SSSR" [The Number and Composition of Population in the USSR], Moscow, 1984, p 221.
4. Zarikhta, T. R. and Nazimov, I. N., "Ratsionalnoye ispolzovaniye trudovykh resursov molodezhi" [Efficient Utilization of Labor Resources of Youth], Moscow, 1980, p 100.
5. Kolosova, R. T., "Ekonomika trudovykh resursov" [Economics of Labor Resources], Moscow, 1980, pp 134-135; VOPROSY EKONOMIKI, No 9, 1981, pp 55-56; PLANOVOYE KHOZYAYSTVO, No 9, 1980, pp 25-26.
6. VOPROSY EKONOMIKI, No 10, 1983, p 89.
7. Suprun, P. I., "Byudzheth vremeni trudyashchikhsya" [The Time Budget of the Workers], Moscow, 1972, pp 64-65; "Rabocheye i bnerabocheye vremya sel'skogo naseleniya" [Working and Nonworking Time of the Rural Population], Novosibirsk, 1979, pp 57, 136-137. A similar interpretation is given in the materials of the budget investigations of workers (see the work by Bolgov, V. I., "Byudzheth vremeni pri sotsializme" [The Time Budget Under Socialism], Moscow, 1973, p 56).
8. "The USSR National Economy in 1984," Moscow, 1985, p 433.
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SAFETY OF WORKING CONDITIONS DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 163-166

[Article by V. D. Roik, candidate of economic sciences (Moscow): "Are Working Conditions Harmful? We Must Know in Order To Improve"]

[Text] The CPSU Program set the task of "considerably reducing manual labor, essentially reducing and in the future eliminating monotonous, heavy physical and unskilled labor, providing for healthful sanitary-hygienic conditions and introducing modern safety equipment that eliminates industrial injury and occupational diseases." Much is being done to carry out this task but we must look to see which problems remain.

Where is the money for improvement of working conditions going? According to data of the Scientific Research Institute of Labor, only one-fifth of this money in industry is spent for the development of working conditions and four-fifths go for compensation for unfavorable conditions. Up to 2 percent of the country's national income is used for compensation. In a word, this is a passive approach. It is necessary to change over from a strategy of protecting man from harmful production factors that are revealed in the process of the operation of equipment to a strategy of preventing their appearance in the stage of designing equipment.

The development and creation of technical equipment and technology that provide for healthful working conditions requires an increase in the proportion of expenditures for these purposes during planning. Calculations of the All-Union Central Scientific Research Institute of Work Safety of the AUCCTU show: even in the 1990's, if the existing policy for distribution of funds continues, losses of the society from unfavorable working conditions will exceed the necessary additional expenditures. This means that it is necessary to loosen our purse strings today. The useful effect will make it possible to recoup expenditures.

The economic mechanism should provide the impetus for the appropriate actions. It is necessary for the scientific research institutes and design bureaus to establish an indicator of activity that makes it possible to evaluate the social effectiveness of new technical equipment and products according to the factor of working conditions. The enterprises need a system of prices which

would provide incentive for the output of this kind of equipment. In the stage of operation it would be desirable to increase the differentiation of deductions for social insurance. The more technical equipment that causes unfavorable working conditions found at an enterprise, the greater the expenditures it must make on reproduction of the labor force. It is also important not to lose sight of the fact that individual machines form different working conditions than sets of machines and technological lines do. Then there will be a changeover to a really comprehensive evaluation of machine systems in terms of the working conditions.

In addition to economic measures, organizational measures are required. First of all it is necessary to improve the quality of the expert evaluations of plans and to increase responsibility in state acceptance of new technology and production facilities. According to data of the USSR Gosstandart and the AUCCTU, every third plan, every third unit of equipment that is produced, and every fourth enterprise that is put into operation has serious shortcomings in the area of work protection. The union Ministry of Heavy Machine Building, Ministry of Construction, Road, and Municipal Machine Building, Ministry of the Light and the Food Industry and the Ministry of Tractor and Agriculture Machine Building are "distinguished" here. The branch organizations conduct their evaluation of technical equipment and technology in the majority of cases in the stage of testing the prepared models, before they are released for series production, when it is difficult to eliminate the defects. Interdepartmental agencies responsible for expert evaluation in terms of protection of labor conduct only selective tests and also in the late stages.

The greater the responsibility of the USSR Gosstandart, Ministry of Health, and Gosstroy as well as other authorized agencies the better the expert evaluations will be. When technical equipment is accepted it is also necessary to strengthen the role of representatives of ministries and departments that operate the new equipment. If it does not meet the requirements in terms of work conditions there is the right to "veto" it.

Practice shows that the means for protection of labor are dispersed and there are no concentrated attacks in the main areas. A leading position in the structure of occupational diseases belongs to diseases of physical etiology--noise, vibration, ultrasonic sounds, and then come diseases of dust etiology, and following these poisoning and diseases of chemical etiology, and so forth. The funds are directed, however, toward measures that are easily taken. First of all they take measures for improving the lighting of the work places. Calculations show that the necessary level of light will be achieved after 3-4 years, but for noise and vibrations it will not be for 8-10 years. A sharp reorientation is crucial.

There is much confusion in norm setting. In branches of industry expenditures on improving working conditions per one worker vary by a factor of more than 7. Even in related machine building branches the ratio is 5:1. Expenditures on eliminating harmful working conditions differ even more distinctly. Deviations from the average for industrial ministries also reach a factor of 7 and interbranch differences reach up to a factor of 60! Differences in working conditions in related machine-building ministries are 10:1.

There are no unified methods for comprehensive evaluation of the conditions for labor for all levels of management, no unified methods and plans for hygienic evaluation of new technical equipment and technology, and there are no normatives of expenditures for the formation of healthful working conditions when designing and reconstructing enterprises.

Scientific and technical progress means a reduction of the physical loads and at the same time increased attention, on-the spot thinking, prolonged exercise of the memory, and rapid and precise motor reactions. There are new requirements and new diseases. In the United States the number of cases of cardiovascular disease increased by 7 percent from 1969 through 1977, by 20 percent in 1978-1980, and the average number of psychological illnesses increased by a factor of 1.5 in 10 years (1956-1965) and by a factor of 2.5 in 1965-1977. Working conditions today include responsibility for the results of production and the functioning and maintenance of costly equipment.

Unfortunately, none of this is sufficiently taken into account. Monotonous labor is widespread as before. Thus operators of one of the automatic lines of the Kharkov Serp i Molot Plant spent more than half of their working time loading and unloading it and the operations consist of 2-4 elements lasting 4-21 seconds. It is not surprising that there are large number of people who quit. Turnover of sewing machine operators has reached 43 percent and 53 percent of those who leave are under 22 years of age. On the assembly conveyor and in the press shops of the Moscow Plant imeni Leninskiy Komsomol labor turnover is 25 percent while the average plant level is 10.9 percent. In the assembly of generators on the impulse conveyor of the Moscow ATE-1 labor turnover has reached 75 percent. In AvtoGAZ and at Rostselmash a considerable contingent of temporary workers are engaged in monotonous and heavy operations.

Chemistry is one of the branches that determine scientific and technical progress. But it is a hidden and sometimes merciless enemy of the health of workers. In the United States chemical substances have been the direct cause of death of 300,000 people who died from cancer in 1982. Each year the world produces about 500 new products and preparations whose biological activity is practically unknown. According to data of the World Health Organization the maximum norms for exposure have been established for only 1,200 chemical substances. According to estimates, because of the length of time required and the high cost of toxicological research it will take about 80 years using the existing methods to determine the toxic properties of the 40,000 substances in existence.

This is a problem for our country's national economy as well. Because of the dispersion of efforts and funds and the unsatisfactory scientific and technical base, the institutes of labor hygiene and occupational diseases of the USSR Ministry of Health and the branch scientific institutions perform only a small part of the work necessary for hygienic norm setting for chemical substances, of which there is an increasing number with unknown toxicological properties. The All-Union Toxicological Center is in immediate need of research. The financing for its activity should be provided by the interested ministries and departments.

Scientific and technical progress in production is accompanied by many unfavorable factors: ultrasonic waves, high-frequency electromagnetic fields, laser and other kinds of radiation. The fight against these should begin with the diagnosis of the possible dangers--methods and equipment for measuring and criteria for evaluating the harmful influence on man. The majority of enterprises are not provided with means of measurement. Industry does not produce instruments for measuring the levels of static electricity, the penetrating radiation from laser installations, stochastic vibrations, direct or indirect brightness, pulsations and blindness. The output of traditional means of monitoring production factors (gas analyzers, anonometers, thermometers, noise meters and a number of others) lags severely behind the need for them.

On the whole, we need no less radical changes in the area of improving working conditions than in other areas.

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CREATION OF BRIGADES DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 167-171

[Article by V. K. Chunikhin, head designer (Moscow): "What Kind of Brigades To Create and Where"]

[Text] Branch centers for scientific organization of labor are producing many important and necessary works for the enterprise. But here is the problem: they frequently do not have enough "ties" which would show how to carry out the recommendations. And a standard or example is needed. This is what we are engaged in in our organization. For an example let us take the selection of indicators for the brigade.

The basis of the recommendations we have developed for creating brigades and determining their indicators is composed of diagrams. According to them we establish the types of brigades that correspond to the organization and also the indicators for the brigades.

Diagram 1 gives the tie between the organization of production and the types of brigades. With technological division of labor and an extensive products list, the lathe, milling, and planing shops usually produce a large number of items. Thus of the overall number of models of machines produced by the Presnenskiy Machine-Building Plant, the average consists of more than 1,000 parts. Each of the parts has a cycle of processing, including 8-12 operations and, consequently, parts are moved from one machine to another about 10,000 times in the manufacture of a set of parts for just one machine. The time for performing the operations differs for each item, which makes planning of the input and output of items more difficult. There are "holes" which appear in the labor process of machine tool operators. It is impossible to eliminate all of them but one can create conditions whereby the machine tool operators can combine auxiliary jobs that create "bottlenecks." Even with a reduction of the time for each of the interoperational movements to one second each would provide a savings in the cycle of manufacturing a set of parts per machine of about 2.7 hours. And the blank pieces "lie around" much longer than this.

Figure 1. Determination of Type of Brigade, Depending on Organization of Production

| Type of brigade | | Type of production | | | | Organization of production | | | | | | Service of work places | | | |
|-----------------------------|------------------------------|--------------------|--------|-----------|-----------|---------------------------------|---|----------|---|-----------------------------|---|------------------------|--------------------|-----------------|-------------------------------|
| | | Technology | | Equipment | | Division & cooperation of labor | | Planning | | Organization of work places | | | | | |
| | | Group | Object | Special | Universal | | | | | | | By equip-ment | By object of labor | Operation, part | Component, set, kinds of work |
| | | | | | | | | | | | | | | | |
| By occupational composition | Comprehensive | 0 | + | 0 | + | 0 | + | 0 | + | 0 | + | 0 | + | 0 | + |
| | Specialized | + | 0 | + | 0 | + | 0 | + | 0 | + | 0 | + | 0 | + | |
| By shift work | Shift work | + | 0 | + | 0 | X | X | + | 0 | X | X | 0 | + | 0 | + |
| | | 0 | + | 0 | + | X | X | + | 0 | X | X | + | 0 | 0 | + |
| By accounting | Part, operation | + | 0 | X | X | X | X | + | 0 | X | X | 0 | + | X | X |
| | Component, set kinds of work | 0 | + | X | X | X | X | + | 0 | X | X | + | 0 | X | X |

Conventional symbols: (+) -- Element of organization of production, corresponds to type of production, (x) -- element has little effect on type of brigade, (0) -- element does not affect type of brigade.

There are two ways of eliminating time losses. One of them is through improving the organization of the transportation service. Another is the development of ties between basic and auxiliary processes through combining occupations. At the Plant imeni 1-Maya blank pieces are delivered by transportation workers to intermediate sites. They are taken from these sites to the work places by the machine tool operators themselves. Thus no time is wasted waiting for the blank pieces to be delivered to the machine tools of the basic workers. At a number of enterprises the brigades include auxiliary workers. They perform minor repair of equipment and transportation and adjustment work. Here it is expedient to plan comprehensive brigades. When processing large parts or in apparatus processes, where the time for performing the operation goes beyond the shift, multiple shift brigades are planned. The diagram gives models of this solution. The type of brigade has been determined in keeping with the reserves for the organization of production. The reserves for improving planning, norm setting, and payment, stimulation and conditions for labor have also been taken into account.

Figure 2 reflects the tie between the type of brigade and the indicators. For example, in a comprehensive brigade a great deal of significance is attached to the interreplaceability of workers. There is development of ways of increasing qualifications and mastering associated occupations. When combining occupations and running more than one machine tool, there is less manual, unskilled labor per unit of the item. Hence one of the indicators of a comprehensive brigade is a reduction of the labor-intensiveness. The absolute amount of the reduction is established after the verification of the difficulty of the norms for basic and auxiliary workers.

After the indicators have been determined they are reflected along with the long-range plan for their improvement in the "Brigade Passport."

Our recommendations are tested at the Kolyubakinskiy Needle Plant. We hope that our development will be useful for the planner both in the initial stage of the creation of brigades and when improving the organization of already existing ones. For the latter case it gives recommendations for improving indicators that are linked to organizational elements. Additionally, they are indicated according to their relationship to the basic elements of the production process--equipment, materials and labor. For example, division and cooperation of labor: "For running more than one machine tool and combining occupation, providing various kinds of rapid pressing devices and fastening adapters and means of active monitoring, signalization and automation of the processing cycle." It goes on to point out which indicator is affected by the measure: "...Reduction of labor-intensiveness. Improvement of the utilization of equipment." And this is done for all elements (external and internal planning of assignments for the brigade, the organization of work zones for the brigade, service and so forth).

Taking the type of brigade into account, measures are given for improving all possible indicators for this type. The planner determines the actual amount of the indicator and then calculates its changes as a result of one measure or another. Thus the basis is created for a long-range plan for increasing the effectiveness of the brigade as a result of organizational and technical measures.

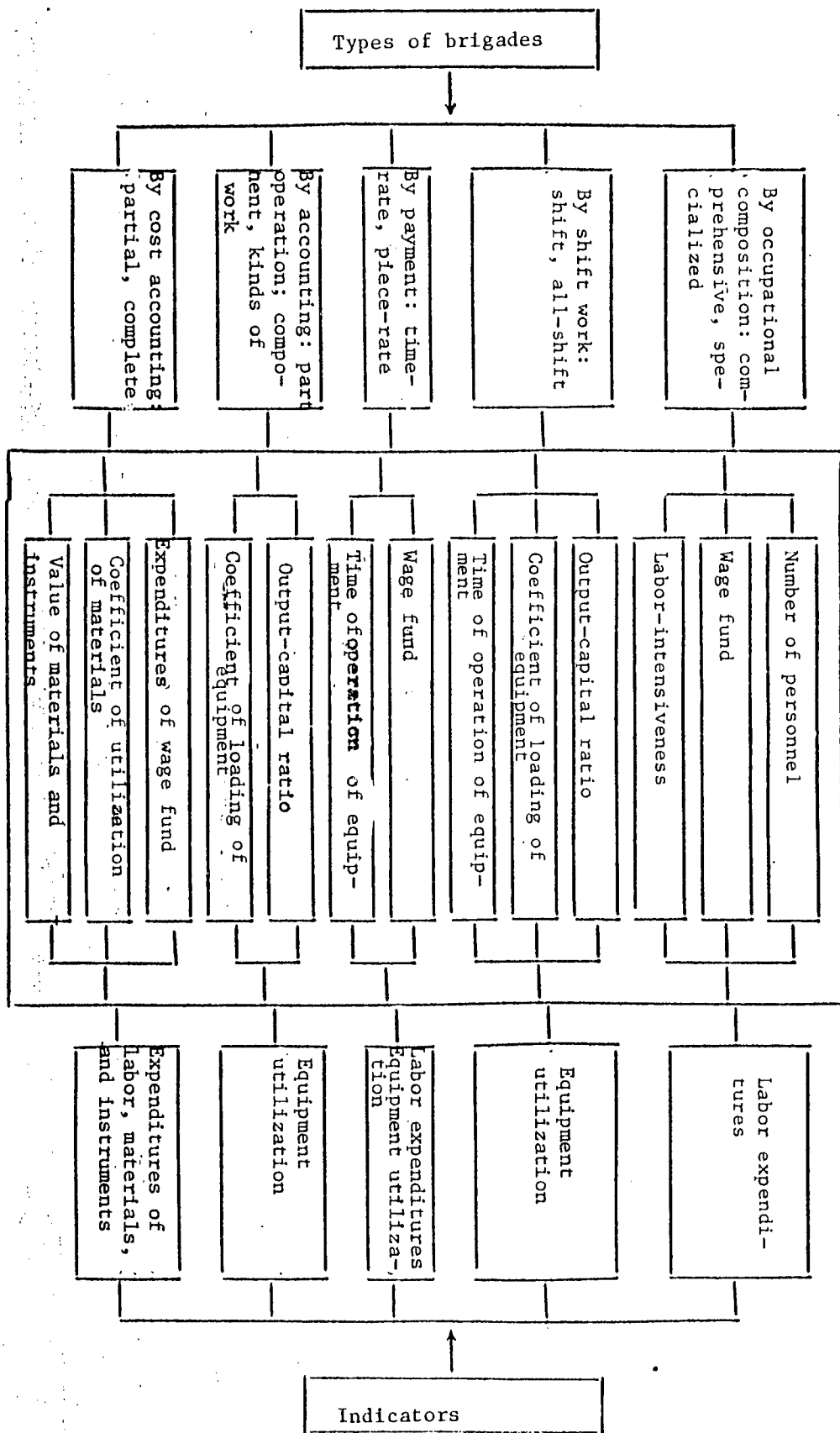


Fig. 2. Link Between Types of Brigades and Production Indicators

Our design bureau has also developed instructions for improving the organization of auxiliary production at the enterprise. We have in mind repair, transportation and instrument services and so forth. It contains three sections: how to conduct on the spot study and analysis of the effectiveness of auxiliary services; how to plan new labor organization; and, finally, what the standard should be. The enterprises are conducting a diagnosis and analysis of shortcomings and then the existing conditions are compared to the standard and measures are planned which will make it possible to eliminate the shortcomings.

This kind of work was conducted for small-series production at the Presnenskiy Machine-Building Plant. Here, because of worn-out equipment, minor breakdowns were frequent. Moreover, idle time because of these amounted to up to 75 percent of the idle time because of malfunctioning of equipment. All kinds of breakdowns were written down; they were submitted to the machine tool operators. It turned out that they could have eliminated the majority of them themselves. Now breakdowns are repaired by the repairman while the machine tool operator stands and waits. In order for the machine tool operators to handle minor breakdowns themselves it is necessary to create the corresponding conditions and provide them with spare parts. During this time the handyman can do preventive repair which reduces the amount of idle time because of emergency breakdowns.

In what cases is it expedient for the basic workers to perform repair or other auxiliary jobs? Will this not have a negative effect on the productivity of the basic worker? We obtain an answer for a specific case in the calculation of a schema for functional division of labor. When trying out the instructions at 18 enterprises of the USSR Ministry of Light and the Food Industry, measures were earmarked for improving the work of auxiliary services. The overall economic effect of the work that was done amounted to 442,400 rubles. The instructions were sent out to all the enterprises and applied in other branches as well.

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NEED FOR SMALLER ORGANIZATIONAL FORMS NOTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 172-174

[Article by B. S. Petrovskiy, candidate of technical sciences, scientific manager of the Laboratory for the Application of Polymer Construction Materials at the Ternopol Branch of the Lvov Polytechnical Institute: "Smaller Forms Are Also Needed"]

[Text] Large scientific production associations are the leading organizational form of integration of science and production, which contributes to acceleration of the realization of the achievements of scientific and technical progress. But along with them, in our opinion, smaller forms are also needed--mini-NPO's.

What role should they play? It seems that they are effective when solving particular applied problems related to further development of certain scientific and technical areas and when conducting research and development on order from branches and enterprises. Experience in the functioning of miniforms has also been accumulated abroad.

In our opinion, it would be expedient to create mini-NPO's at VUZ's which have capabilities of carrying out course and diploma projects related to the actual production activity of the future clients and also in divisions and sectors of scientific research institutes that are solving specific applied problems. In conjunction with one branch or another here it is possible to organize a laboratory and in it shop for sections which realize innovations. But this does not mean that the mini-NPO's should operate only for one branch. They can perform some of their work on orders from other branches.

There is experience in this kind of cooperation in the Ternopol Branch of the Lvov Polytechnical Institute. Here, in conjunction with the USSR Ministry of the Gas Industry and the UkrSSR Ministry of Higher and Secondary Specialized Education, a branch laboratory was created for applying polymer construction materials in gas transportation equipment. The introduction of special seals developed by our branch laboratories on compressors of main gas lines in 1980 made it possible to save a half million rubles. And only 80 kilograms of second-hand (we emphasize this) capron were used to manufacture the seals. Plastic parts frequently cost less than metal ones by a factor of 3-15,

although a kilogram of the initial raw material is 10 times more expensive than metal. The effect is obtained as a result of the fact that the plastic part is several times lighter than a metal one (the seal weighs one-sixth as much), and the wastes of materials during the process of manufacture do not exceed 10 percent.

The technological process is fully automated: when manufacturing parts on thermal plastic automated machines one uses a small-cycle reduced-waste technology and expenditures of labor and energy are sharply reduced.

When a difficult situation arose in the main pipelines with the seals of the ball cocks, our laboratory developed and created the right seals. Their quality is just as good as that of the previous ones but they are considerably less expensive.

Having successfully completed the crucial development we took up the prediction of what parts could malfunction in the future and how soon. As a result we created a plastic-metal labyrinth packing which successfully passed the test in operation of sets of gas-pumping equipment.

Under the 11th Five-Year Plan the utilization of polymer materials in machine building increased by 40 percent and in automotive construction--by a factor of 2.5. A great effect can be achieved from polymers in other branches as well, but it frequently remains unrealized. As early as 1972 there was a detailed announcement of the positive results of preliminary tests of plastic bearings and seals on equipment of sugar refineries. But the UkrSakharprom of the UkrSSR Ministry of the Food Industry did not support the innovation. The annual loss from this rejection amounts to 60,000 rubles for just one plant.

The introduction of new developments in plastics proceeds more effectively with repair and operations work. Having studied the results of operation and been convinced of the advantage of plastic parts, the designers are beginning to use them in new technical equipment. The Uralskiy Turbomotornyy Zavod Production Association (Sverdlovsk) has actively engaged in the work of applying these parts in compressor construction or when they became convinced of their advantages in the operation of gas lines.

Only after 5 years of use of the seals for compressor cylinders did the plants manufacturing this equipment stop using bronze rings for the cylinders and change over to capron ones. I think that even these cases, in which the developments of the laboratory have prompted the designers of new items to use plastic, already convincingly show the advantage of NPO's. But this requires that the small scientific organizational forms have a production base where they can realize their innovations.

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INDIFFERENT ATTITUDE TOWARD POOR MANAGEMENT DEPLORED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 174-176

[Article by N. I. Lisafyev, instructor at the Vladimir Aircraft Mechanics Tekhnikum imeni A. V. Belyshev: "Lessons in Management"]

[Text] ...An electric car with boxes filled to the top with parts was traveling through the area. At each step there was broken asphalt and potholes. The electric car lurched and several parts fell on the asphalt. The young driver indifferently glanced past me as I was waving to him. And yet he was yesterday's schoolboy, a graduate of a vocational and technical school or a tekhnikum. And even in the shop where he works there is probably a school of economic knowledge. The parts fell before the eyes of other workers at the enterprise. Their reaction? None, zero emotions.

Unfortunately, there are too many examples of minor mismanagement and indifferent attitude toward it. After all, all of us receive some kind of economic training. Graduates of educational institutions are "economically matured" in schools of economic knowledge. To be sure, this maturation takes place a little too late and is not always successful. Considerably earlier and more effective methods are necessary to form economic vision and the proper attitude toward the surrounding world. Then there is less bungling, the hand automatically turns off the water, turns off the switch, if the light is not needed at the given moment, does not put the machine on a forced schedule, and so forth.

Specialists established long ago that children have the freshest and keenest perception. This is exactly the time to begin to develop an economical approach to real life!

But let us open the mathematics test for the third grade, which was approved by the USSR Ministry of Education (Moscow, "Prosveshcheniye", 1983, 14th reworked edition). Having conscientiously read the textbook I encountered only two (out of 630) "economics" problems: concerning a malfunctioning faucet and the quantity of water that is uselessly flowing from it over particular segments of time, and about waste paper and notebooks. Moreover, approximately 20 percent of the problems were variations on the subject of the notorious problems about the basin and pipes.

Why not give third graders, for example, problems like these? An indifferent worker when leaving work on Friday at 6 p.m. did not turn the water faucet off tightly. He did not rectify his error until Monday at 8 a.m. How much money flowed into the sewage system if three buckets of water flowed from this faucet each hour and 100 buckets cause 8 kopecks? How much money was lost and how much poorer did we become if during these days and hours in the city 14 faucets were not shut off tightly?... Or, three tractor drivers come home for dinner and do not turn off the engines of their tractors while they are eating. During an hour of idling the engine consumes 1 liter of fuel valued at 12 kopecks. In a year they come home to eat 100 times. How much money has flowed through the exhaust pipes to no advantage while the tractor drivers were eating?...

It seems that the expressions "flowed into the sewage system" or "flowed out of the exhaust pipe," and so forth are more comprehensible to young schoolchildren than the abstract word "losses" when it is not associated with anything. It is hardly necessary to prove that the language of these problems should be familiar to the children.

As the students grow up the mathematical "architecture" of the problems that are given becomes more complicated. For example, what is more advantageous--to lift a load to a height of 3 meters, using 6 kilowatts, and then lower it along an inclined channel using the force of gravity, or to construct a horizontal transporting device using an electric engine with a capacity of 8 kilowatts to move this load with the same productivity? The length of the channel is 12 meters and the cost of one running meter is 10 rubles, while the period of operation is 3 years. The length of the horizontal transporting device is 20 meters, the cost of one running meter is 8 rubles, and the period of operation is 5 years. One kilowatt hour costs 4 kopecks and in both cases the load is moved for 3,500 hours a year. One can give a number of "crucial" problems in ecology, for instance, what it costs the society to have a momentary savings on the construction of purification installation; in geography--which is more advantageous: the watch method of assimilating deposits or the construction of a permanent settlement with the corresponding infrastructure?

So far there are no problems like these in the schools. But it is not very difficult to make them up. I am prepared to offer my services. I am convinced that many enthusiastic people will be found. But we cannot put this important undertaking on a "formulaic basis." Unfortunately, we are still in a situation where the USSR Ministry of Education considers the creation of textbooks to be planned work for workers of the USSR Academy of Pedagogical Sciences and therefore the authors "for their part" automatically become competitors for similar planning assignments with all the consequences that ensue from this. If they were to declare a competition for the best textbook and the best problems, it would really have to be open.

For younger schoolchildren one could perhaps do without a special subject called "Lessons in Management" if problems with management and economic content (no less than one-fourth of all the problems) were included in the mathematics course. It seems that solving them and, the main thing, informal

discussion of them in class would correspond to the principle of unification of training and developmental work. But this subject is necessary beginning with the 6th grade. Who will teach it? It depends on the specific conditions and the composition of the educators. The teacher hardly needs special training, but an understanding of the problem and a genuine interest are, of course, necessary.

If in the primary grades in classes the students were to hear the words "efficiently," "economically," "rationally," "thriftily" and so forth, when entering the vocational and technical schools, the tekhnikums, and the VUZes the students would be less infantile in their economic preparation and the new knowledge would be planted on prepared soil. As a result there would be a more rapid economic adaptation by the graduates to production, more practical, businesslike and skilled economic substantiation for decisions that are made and a thriftier attitude toward the public wealth.

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THEATER DIRECTOR REVEALS CHANGES

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 177-182

[Interview with V. V. Fokin, head director of the Moscow Theater imeni M. N. Yermolova, honored artist of the RSFSR, by B. Yu. Kagarlitskiy: "Experiment in the Theater"]

[Text] The concepts of "experiment" and "art" are so closely interconnected that combining them does not surprise anybody. But in this case we are speaking precisely about an organizational and economic experiment which was begun in a number of theaters in the country on 1 January 1987. If its results turn out to be positive in 1989 it will be the basis for the organization of all theater work. The theater will undoubtedly have its own specific features as an object of management, but many problems of the modern theatrical enterprise cause one to think about more general issues of restructuring. The head director of the Moscow Theater imeni M. M. Yermolova, an honored artist of the RSFSR, V. V. Fokin, describes the organizational and economic changes that are taking place in the theater.

[Question] Valeriy Vladimirovich, you were one of the initiators of the experiment being conducted in the theater. Tell us please what it consists of, what its economic tasks are and what it provides from a creative standpoint.

[Answer] It seems to me that it is necessary to clarify the question. Indeed, I was one of the initiators in the sense that I formulated certain proposals. But one cannot speak about the origin of this experiment without taking account the processes that have taken place in the society. I am not just saying this for effect. The changes in our social life have brought about a need for changes in the theater as well.

[Question] This need probably existed previously as well, could you express it in simple words?

[Answer] People at various levels have long been saying that the theater needs a reform, that nothing has changed. Now, finally, it has become possible to change something in practice. What is the essence of the experiment? For a long time--years, decades--theaters existed like production

enterprises, within the framework of a certain mechanism. An entire system of commitments was developed. For example, the theater was to produce four performances a year. If there were less the plan failed, there would be no bonus, and so forth.

[Question] In brief, is this the same kind of "growth output" from which economic workers are suffering?

[Answer] Absolutely. There is also a rigid distribution charge for employees and a number of financial and economic restrictions. In brief, everything is just the way it is at a production enterprise.

[Question] With the difference that the theater is an enterprise that is planned to operate at a loss....

[Answer] Yes, plan to operate at a loss. But the most important contradiction is that the theater, like any other artistic institution or, more precisely, an institution which wishes to engage in art, cannot exist within the same rigid framework as an industrial enterprise does. The theaters have begun to suffocate.

[Question] Well, one must say that plants have also suffocated under such conditions.

[Answer] Undoubtedly. But this situation is even more unnatural for us. But our hands were completely tied. How can one speak of initiative under these conditions? Just take the relations with the authors. Even here we were terribly hemmed in by the bureaucracy. When the theater wants to put on a new play the playwright must show it to the administration of culture and the ministry; they will discuss and correct it; and only then is it returned to the theater. And yet the play is written for us and we are the ones who must work with the author. Directly.

[Question] This again reminds us very much of the problems of ordinary production when solutions are made above, bypassing those who are directly affected.

[Answer] Now the theaters will be able to enter into contractual relations directly with the authors. Another issue has to do with four productions a year. If we did not meet this norm previously there was a scandal.

[Question] But what if there are more than four?

[Answer] There can be more. That does not work out either: there are financial and other restrictions which would be violated in this case. The theaters are not actually their own masters. We do not have any independence. We cannot be responsible for our product. There are periods when it is necessary to create five productions while in another season there will be one or two. And the theater itself can see and understand best how many productions to launch. After all, this is creativity! The money for four productions a year is allotted beforehand. But there are expensive productions and inexpensive ones.

[Question] What will the experiment do in this respect?

[Answer] First of all, we shall launch as many productions as we wish to. Previously the subsidy was calculated from the level that had been achieved. Nobody remembers the basis on which the initial sum was established. Then it was regularly reduced for all theaters that were more or less successful. Now for the period of the experiment they have a constant sum for the subsidy. The part of the subsidies that is saved--our "profit"--now remains at our disposal. Additionally, the wage fund and the number of spectators is also established in the plan. Everything else is in our hands. This increases the responsibility of the theater a great deal. At least it is now clear who is who. While previously the products were accepted for the plan, now things will be different. The artistic council simply will not let pass a poor production. And it will not be the administration of culture but only the artistic council that will accept productions under the conditions of the experiment. We will create them ourselves and we ourselves will be responsible for them. The theaters where the spectators go and those where they do not go will be in different situations.

[Question] And how is the problem of the staff distribution resolved?

[Answer] This is not clear yet. I hope that we will be able to control it. In terms of the staff distribution, we assume that we will have two administrators. But it would be better for us to have one and for him to work well and receive twice as much money.

[Question] This is very reminiscent of the Shchekino Method.

[Answer] Yes. The experiment even gave us the opportunity to increase the wages of the actor who has played the leading role for a season, 3-4 months or a half-year.

[Question] But it is necessary to obtain money for this. Will the wages be increased at the expense of other actors?

[Answer] No. According to the distribution chart I have 72 artists in the theater. If we reduce the size of the troupe, there will be additional money.

[Question] But how can you reduce the size of the troupe? Is there some mechanism?

[Answer] This year a system of reelection has been introduced in all theaters. Here we are speaking not about the experiment but about an established practice, although without it the experiment simply would have been impossible. This is already an important step in the theater reform.

[Question] I should like to know what problems arise here?

[Answer] By a decree of 1 March 1986 the USSR Council of Ministers introduced a system of reelection of the creative staff once every 5 years. Just as it is in scientific institutes. All actors and directors except for the head one

are reelected by a secret vote. The head director is certified by the ministry. Many people do not like the system of reelection. I am one of its proponents. It is criticized, but what alternative is there? If this system is not an instrument to punish the artist, and if this is a serious discussion about the destiny of an individual and the destiny of the theater, it is a significant measure. But if this system becomes an instrument of punishment for those who are unwelcome, it is immoral. The question is how to avoid such a utilization of rules like these. A good deal depends on the responsibility of the management.

The reelection took place in our theater in May 1986.

[Question] The artistic council is reelected. But who forms it?

[Answer] We are now speaking about creating elected artistic councils. It is not a simple issue. In one theater it will work and in another it might not. Everything depends on what kind of theater collective it is. I am very satisfied with the way our election went: people both talked and voted. They spoke openly, and this is very important. Those who did not agree with me told me directly of this. Under these conditions the new measures can work.

[Question] In other words, a great deal depends on the composition of the artistic council and it in any case depends on the composition of the troops and what kind of people are in the theater. This model will work differently in good theaters and in bad ones. It will further strengthen a consolidated collective and one that is not consolidated will fall apart even more. Is this right?

[Answer] Yes, it is quite possible for the head director to use this system against the actors.

[Question] Obviously, the artistic council should express the collective will of the theater. The problem is that sometimes there simply is no collective will. It has not been formed.

[Answer] Undoubtedly. But I want to emphasize that with all the outlays involved in the new measures, this is still an important step forward.

[Question] I should like to clarify a couple of more issues. The "bureaucratic enclosure" has been felt most of all in the provincial theaters. What will the changes do for them?

[Answer] Not only Moscow theaters but also provincial ones have been included in the experiment. It is understandable that many things might not work out for them, but negative experience is still experience. It is clear that many of them are not prepared for the changes. My article in SOVETSKAYA KULTURA on 12 December 1985 regarding the restructuring of theater work, for example, evoked a sharp reaction. I was told that I was an extremist, that I want to introduce unemployment for actors, that I want to change everything into agreements and so forth. In the first place, what I want is not very important. There are ministries and management agencies, and they solve problems of restructuring. And in the second place, I was speaking only about

an ideal model, whereby some of the troop would be on the staff and some would be under a long-term agreement, while others would be under a short-term agreement. This system exists, for example, in Hungary, and there is no problem of unemployment of actors there. It is another matter if you are simply a bad actor: then you should not be doing this work. Now, unfortunately, we are not ready for a radical change following this model.

[Question] Are they ready in the theaters themselves?

[Answer] In the theaters themselves the people have been complacent in their jobs and now suddenly there is a reelection!... They are afraid.

[Question] This means that it is not simply a matter of poor understanding. Do some people understand that the changes threaten their position?

[Answer] I think so. Incidentally, the position of the Ministry of Culture is somewhat ambiguous concerning this issue. Certain theaters have conducted reelections while others have put this off. For a year. The ministry has allowed this. It is necessary for everyone to start this at once! No, many say: we shall wait, we feel sorry for the artists."

[Question] Will the reelection system perhaps be abolished soon?

[Answer] Some people hope so. In 1986 some people conducted a "rehearsal" of the reelection. How is that possible: to rehearse a vote? Or is it a rehearsal of punishment? In that case I understand!

[Question] The experiment and changes are bringing about movement not only among those who wish the restructuring, but also those who do not wish it. They are beginning to resist. A new and more dynamic situation is arising. This is very positive, regardless of any expenditures brought about by the experiment. In words, we are all in favor of changing. Now let us look and see what people are doing about them in deed.

[Answer] I have already said that the new approach makes it possible to discover "who is who." In order to achieve anything it is necessary to go through a difficult restructuring. And it should be clear from the very beginning that not everything will work immediately.

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BOOK ON MANAGEMENT REVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 211-218

[Review by I. S. Dreytser, division chief of the Kuznetsk Branch of the Scientific Research and Planning-Design Institute for Extracting Minerals by the Open Method (NIIOGR) (Kemerovo) of the book "V poiskakh effektivnogo upravleniya" [In Search of Effective Management] by T. Peters and R. Waterman, translated from English, Moscow, "Progress", 1986]

[Text] "A single violinist directs himself, but an orchestra needs a director." This is the thought, boiled down to an aphorism, with which Marx concludes his discussion of the fact that any directly public or combined labor needs management to a greater or lesser degree. Which, he clarifies, establishes a coordination between the individual workers and performs common functions that arise out of the movement of the entire production organism as distinct from the movement of its individual organs. (Footnote 1)

It is not at all an accident that this passage from the first volume of "Das Kapital" comes to mind when reading the book by T. Peters and R. Waterman. Although the authors do not discuss the social portraits of directors of American business, nonetheless the subject here is the arsenal of modern management. In other words, it is about what provides for stable economic development--the goal, the meaning and the supertask of effective management.

You will agree that this subject cannot but attract the attention of the reader. The more so since, as is clear from the chapter titles of the book, the authors' theoretical constructs are built on the experience of the best companies in the United States. Incidentally, it is precisely for this reason that this "very serious book on business," as it was called by one of the managers of the Harper & Row publishing house, became the first of a number of national best sellers. And this, as you can see, is not a detective novel nor is it a fantasy that excites the imagination. Incidentally, there is perhaps something fantastic in the number of printings the book has gone through--2.8 million copies by the end of 1984 as compared to the initially planned 15,000! And there are translations in many countries of the world. They have had practically the same success.

To explain such overwhelming popularity of this publication only by the fact that its appearance coincided with times that were not the best for the American economy (the height of the worst economic crisis during the entire postwar period in the United States (apparently is not to tell the whole truth because an essential part of it must be sought in the merits of the work itself, in the thoroughness with which the initial material was studied, in the argumentation for the conclusions, the significance of the factors of effectiveness that are considered, and many other things.

Incidentally, a little bit of the success was provided, perhaps, by the fact that the book is a successful attempt to rehabilitate the system of American management whose crisis was discussed a great deal at the beginning of the 1980's and continues to be discussed even in our day. It is not out of place to recall that mistakes in the organization of the national economy here are directly linked to the inadequate effectiveness of management.

For example, we know of the evaluation of former U.S. Secretary of Commerce Malcolm Baldrige who declared that American management was "too fat and lazy" to resist the onslaught of foreign competitors. And above all the "Japanese challenge" in management which discredited many management doctrines of the first capitalist power in the world.

At the end of 1980 a number of leading magazines in the United States (NEWSWEEK, TIME, and others) printed articles on a common theme--that it was the managers who were guilty of the neglected condition of American business and the magazine FORTUNE published an article with the sympathetic title "Europe Puts a Stop to American Style of Management." And this is under condition when only some 10 years before this period the French journalist Jean-Jacques Servan-Schreiber wrote the book "American Challenge" in which he wrote: "These American aggressors surpass others not because of their financial resources or technology, but because of their corporate-organizational capabilities, and the genius of all this was the American corporation manager."

The need for this rehabilitation was dictated, probably, also by the circumstance that the edifice of American theory of management was constructed mainly by representatives of academic science who were extremely removed from production. I recall that with the exception of Frederick Taylor, with whom the American theory of management began, and a small group of people close to him who were real production workers, as it were, from the machine tool, all the various management ideas were grown in university hothouses. In addition to other factors, this served as a nutritive environment for a certain skepticism about theory.

This skepticism was well reflected in the book by Arthur Bloch called "Murphy's Law" (it came out in Los Angeles in 1977 and by 1979 it had already gone through seven editions). (Footnote 2) Like the memorable "Parkinson's Law" and "The Peter Principle," Bloch's book is a brilliant example of management satire.

And so about theory. "The first myth of management science is that it exists." Incidentally, this is also from the same book: "Even a small

practice involves a large theory." Compare these aphorisms with the position of Taylor who is convinced that management can be transformed into a precise science. Or, for example, that of the authors of a number of landmark doctrines in Western management thought (there has always been an intensive conceptual search here) such, say, as the behavioral psychological school or the later ideas of the "situational approach."

Peters and Waterman, while professing Taylor's theoretical optimism but not sharing the old rationality, a direct legacy of his school, are conducting their research along the lines of modern ideas of a comprehensive approach to the management of an organization as a social system. In the words of the book "Editor," at the beginning of the 1980's they even managed to cause a third wave of "organizational humanism" in the United States (after the origin of the doctrine of "human relations" in the 1930's and the concept of "human resources" in the 1950's and 1960's). But there is not justification for discussing the appearance of a new "management paradigm." Incidentally, the authors themselves do not insist on this: "Of course, here we are not proposing a complete theory of organization. But we think that the data concerning model companies show certain aspects of a theory which has received no attention either from scholars or from management practitioners" (p 142).

But who are Thomas Peters and Robert Waterman and why is there interest in their book, which seems to have beaten all popularity records in its genre? the leading experts of the management consulting firm MacKenzie and Co., almost the most authoritative in this area in the West, having become interested in the nature of the link between strategy, structure and effectiveness of management, at the beginning of 1970 they organized two research groups. One of them engaged in an analysis of ideas about questions of corporate strategies. The interests of the other were concentrated around the concept of organizational effectiveness.

"If we want changes, we play with strategies. Or we change the structure. It is possible, however," they draw the preliminary conclusion, "that the time has come to revise our approaches" (p 36). Here the authors polemicize with the basic postulate from the book of the business historian Alfred Chandler, "Strategy and Structure," according to which structure necessarily must follow strategy (at the end of the 1970's this management truth was considered "indisputable." The search for new approaches also led the researchers to the most important conclusion to which they are constantly returning in the book: the main influence on productivity is exerted not by working conditions themselves but by attention paid by personnel. This conclusion was implicit in the results obtained as early as the 1930's by Elton Mayo in the shops of the Western Electric Plant in Hawthorne (Mayo's research is known under the title "The Hawthorne Experiment").

The conclusion agrees with the recommendation of one management specialist to adapt the organization to the human being: it is absurd to have an inflexible organizational schema in which it is assumed that any person in a given place will work in exactly the same way as his predecessor did.

With this reference as a point of departure Peters and Waterman came to the conclusion that any reasonable approach to the creation of an organization

should encompass and consider as interdependent at least seven variables: structure, strategy, composition of workers, management style, system and procedures, the totality of acquired skills, abilities in conjunction with recognized values (that is, culture) and also the existing and developing strong aspects of the corporation. This idea became known as the "7-S" schema of the MacKenzie Co. and was accepted everywhere as a successful way of thinking about problems of organization.

In the schema, which the authors' colleagues have jokingly christened "The Happy Atom" (p 45), one of the variables--"combined values"--is placed at the center, as though symbolizing the primacy of the spirit of corporative organization. Here it is not difficult to see a direct link to the already mentioned point of the researchers concerning attention paid to personnel, which is given great weight in the hierarchy of factors of productivity.

Strictly speaking, this parameter is also decisive when singling out criteria according to which the company is considered exemplary. There are eight of them. And one of them is formulated as follows: productivity--from the human being." Among the other special preferences, in my opinion, this one deserves attention: "simplicity of form, modest management staff."

In today's debates about the effectiveness of various organizational structures of management, we are somehow very shy about speaking about reasons for inflation of the staff. And yet it is in the bosom of the structural forms that the corresponding level of effectiveness of management is formed and, in the final analysis, the effectiveness of management itself.

The upper echelons of management in model corporations, as a rule, are not large, as the work under consideration shows. Billion-dollar enterprises are controlled by staffs of less than 100 people. The authors refer to the old aphorism of Ray Kroc, who thought that in the management of a corporation "less means more" (Slamburger, a 6-billion multiproduct company in the petroleum business, controls his world empire with a management staff of 20 people!).

In order to provide for such low "cost" of management a rich selection of means is used--from eliminating paperwork (reports or orders should not exceed one page) to precise manipulation of the motivation of the worker. And when one of the researchers, referring to the success of the Japanese firms of Sony and Matsusita in the United States, writes that the problem of productivity is "not so much an esoteric truth known only to the Japanese as simply a mystery...human loyalty, devotion to the cause of the firm, which appears because of effective training of personnel and identification of personnel interests with the successes of the company...", and a highly placed Japanese manager asserts that Japan's only natural resource is the persistent labor of the people (p 76), there is apparently no reason to see in such statements only a demagogic device. Although the book under review is rich in examples of social demagogy, especially in the chapter on motivations.

But if such things are peeled away from the work (even Marx spoke about two aspects of the "labor of management and supervision") the thoughtful reader will find in it answers to many crucial whats and hows in economics. Without

agreeing with the prevalent American theory of management by rationalism and without subscribing to the theory of "human relations," the authors' conclusions, I repeat, make it possible to speak about a new concept which, judging from everything is not without practical interest (indeed, there is nothing more practical than good theory).

One of the reviews of the book (and this work has received much press in the West) is called "Economics Without Numbers." And it is as though the author, even with this title, has managed to touch upon a fundamental quality of the work--speaking about complicated economic matters in an extremely simple way, without causing the readers to yawn and frequently coming back to the living essence of the research. Evidence of this are on the shelves of bookstores which for many years have given refuge to such opuses.

Perhaps Peters and Waterman's book is interesting mainly because it introduces the reader to the context of the entire range of ideas that is opened up by the successes of flourishing companies. You reach the moment of truth in effective management through real practical experience enriched by many years of theoretical research and equally supported by extensive economic health (a business should first of all make money). And in the final analysis those noneconomic categories that form the symbol of belief in model companies--value leadership, adherence to their cause, and a special attitude toward the consumer (remember, there are only eight of these distinguishing marks)--do these not serve as prerequisites for strong financial health?

The fanatical obsession with service ("IBM Means Service"), the intolerant attitude toward laxity and interruptions that affect quality and service ("the only possible work is good work"), and the masterful knowledge of demand on the consumer market (the printing on packages of the firm's toll-free telephone number and monthly consideration of the content of discussions with consumers which has become an important source of ideas that make it possible to improve products)--each of these qualities reliably works for success.

"One of our most important conclusions related to model companies," write the researchers, "is that, regardless of their specialization, whether it be the simplest metal product, the latest technology or hamburgers, they all define themselves as service enterprises" (p 216).

On the path to a radical reform of management, the need for which was discussed at the 27th Party Congress, the search for and utilization of any factors of effectiveness becomes the crucial task of the day. Many of the points of Peters and Waterman's book which are aimed at the same search are undoubtedly worthy of increased attention. Individual particulars of this interesting research can be used by our economic mechanism without any social adaptation, as it were, one on one. Here I would include above all the organizational mobility and structural flexibility of economically flourishing companies, the extremely simple management procedures (where a single pithy phrase is enough for an acceptable declaration--a plan for the creation of a new item), intensive informative communication that is cultivated within the organizations, and an attraction to a fewer number of levels of the production hierarchy. And, of course, the special attitude toward innovations. Innovative activity is a most important component in the system of values of

the organization (the so-called "11th Commandment" of the MMM [Minnesota Mining and Manufacturing Company] goes: "Thou shalt not kill the idea of a new kind of product," (p 288).

Certain structural constituents of effective management that pertain to the scale of production and research collectives are not without interest. For example, the somewhat unexpected conclusion that the effectiveness of research is inversely proportional to the size of the research group. Or the rejection of megalomania in production structures.

"The economic conclusions provided by large-scale production," the authors quote the English research John Child, "on the whole are significantly exaggerated, especially during the 1960's when Europe was seized by a fever of mergers and streamlining. The overall conclusion that can be drawn from an analysis of the scale of industrial production consists in the following: Although there are important economic factors that cause small enterprises to be transformed into enterprises of medium sizes, there is no special confirmation that these factors influence large organizations" (p 343).

...Since Marx's time the complexity of managing joint labor has increased steadily. And not so much because the number of violinists in the orchestra of the capitalist economy has increased. The nature of the development of socioeconomic processes has made the director's score itself more complicated. Peters and Waterman's book makes it possible to put one's finger on the nerve of these changes and vectors of conceptual research in management.

And one more remark "under the table." Any positive experience, including management experience, is a valuable economic resource. This is an old truth. Let us take advantage of it. The times require a thrifty attitude toward resources.

FOOTNOTES

1. See Marx, K., and Engels, F., "Soch." [Works], Vol 23, p 342.
2. See excerpts from this book in translation into Russian in EKO 1983 Nos 1-3.

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EKO READERS CONFERENCE HELD IN ALMA-ATA

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 219-220

[Article by A. N. Lyubomirskiy, candidate of economic sciences: "Conference in Alma-Ata"]

[Text] On the initiative of the Kazakh Republic Board of the Scientific Economic Society, in the Conference Hall of the Republic Trade Union Council there was a gathering of managers and head specialists of enterprises and workers of scientific research organizations and training institutions. Those who spoke at the conference approved of the basic directions of the articles in EKO and expressed a number of suggestions for improving the magazine's content.

The deputy director of a heavy machine-building plant (now secretary of the Alma-Ata Party Obkom), K. K. Baykenov, said that production workers glean much that is new and interesting from the magazine but it would be desirable to delve more deeply into questions of incentives for labor and to turn the floor over to officials of the USSR State Committee for Labor and Social Problems more frequently.

The section chairman of the Scientific Economic Society, Candidate of Economic Sciences L. A. Bayzakova, was in favor of having the problems discussed on the pages of the magazine be accompanied by opposing viewpoints, which will make it possible to draw better substantiated conclusions. In her opinion, it is especially necessary to have articles concerning the utilization of internal production reserves, which will be useful to many production workers.

A. V. Boyko, the chief of the administration of the State Committee for Labor and Social Problems of the Kazakh SSR, noted that the magazine does not have enough articles about activating the human factor. In particular, articles about scientific and technical progress should be prepared taking into account its social aspect. It is not enough to raise the problem; it is also necessary to see a path to its solution and to indicate this path. He advised that the editorial staff expand the geographical area from which the authors come.

K. R. Nurgaliyev, a docent of the philosophy-economics department of the State University, said that the EKO articles give good information for training students. From his standpoint it is necessary to improve the quality of articles on interbranch problems and the development of the productive forces of the regions.

Problems of territorial industrial complexes were discussed by A. B. Bekkulov, a docent of the Institute of the National Economy. The development of these complexes directly influences the utilization of raw material resources, the development of transportation, and the ecology. In his words, EKO could show how to manage such complexes.

The deputy editor in chief of the magazine, Dr of Economic Sciences B. P. Orlov gave information about editorial plans, the participation of the magazine's authors and the development of problems of branches and regions of the country, and current problems of the development of the national economy.

Also discussed at the conference was the work of the editorial staff of the magazine NARODNOYE KHOZYAYSTVO KAZAKHSTANA, which was 60 years old in 1986.

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INDUSTRIAL SHIPPING PRACTICES SATIRIZED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 pp 221-222

[Article by Aleksey Mineyev: "In Search of the New"]

[Text] The newspaper VECHERNIY KHOKHMOGORSK announces: "An interesting undertaking originated at the Khokhmogorsk Footwear Factory: they have begun to send some of the products to the consumers in special boxes. This box can be used to send the goods back. The box contains the return address of the factory. Now when the consumers receive defective footwear they can send it back to the factory quickly and without trouble. The innovation saves time and should please the consumers."

An interview with the director of the Khokhmogorsk Footwear Factory:

"Tell us please, how are things going with the introduction of another undertaking that appeared within the walls of your enterprise?"

"We intend to continue this important work. For example, we have set the task of sending out no less than 80 percent of the goods in packages with a return address by the end of the year. But, as you yourself understand, it is not simple for innovations to make their way into reality. Certain of our comrades are slow, very slow in adjusting...."

From a speech by the chairman of the Khokhmogorsk Footwear Factory at the Association's economic aktiv meeting: "...As you know, we were the first to introduce the original form of communications with the consumers. We have already reached a level where more than 93 percent of the output is sent into the trade network in the new packaging.

"But there are also difficulties: it has long been time to automate the process of writing the return address on the packaging, and yet we write it in the old way, by hand. This leads to mistakes and the returned items do not always reach us. Our associates are also letting us down: the material delivered by them for the boxes is of poor quality, the boxes are deformed, and the post office will not accept them, which causes just complaints...."

"But nonetheless, permit me to assure the management of the association that even next year all of our products can be returned rapidly and without any problem!"

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SATIRICAL APHORISMS FROM BUSINESS LIFE

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 4, Apr 87 p 222

[Article by Veslav Brudzinskiy translated from the Polish by Val. Vorontsov: "Fabrications"]

[Text] "Although my predictions do not always come true," he said, "things happen so quickly that nobody is left uncertain."

Do not ask your boss questions which you yourself cannot answer.

He who wants to become his boss's boss too quickly can end up being his subordinate's subordinate.

There are honorable teachers who when feeding others' views into others' heads, leave nothing for themselves.

Try to be tolerant of those who have not grown up to your prejudices!

There are people who do not believe those with whom they associate, but they do not associate with those whom they believe.

It is striking what brilliant thoughts come to his head and what a pathetic condition they leave it in!

There are specialists for correcting small mistakes at a large price.

Be polite: hear your subordinate out when he is proving to you that you are right.

One must pay for a lack of enemies with a lack of success.

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